REPORT ON THE MANITOBA SYMPOSIUM ON HAZARDOUS AND SPECIAL WASTES

Volume 2

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MINISTER'S CLOSING ADDRESS

ENVIRONMENTAL MANAGEMENT SYMPOSIUM

March 16, 1983

Winnipeg Convention Centre

Bill Kennedy:

Good morning Ladies and Gentlemen:

I would like to welcome all of you to what I think will prove to be a very interesting and enlightening symposium, commencing this morning right now and going until Friday noon.

At this time I would like to start the symposium by introducing to you some of the people at the front table here before you. These people are mainly the Steering Committee that has worked to organize and coordinate the symposium. The Minister of the Environment, Mr. Jay Cowan, has provided a grant to an inter group organization, non government group, to sponsor this symposium and starting at my extreme left I would like to introduce you to Mr. Al Cerilli with the Manitoba Federation of Labour, then beside him is Mr. Dennis Muldrew representing the Manitoba Naturalists, beside him is Mr. Jim Knight who's representing the union of Manitoba Municipalities. Turning over to my right I would like to introduce you to Dr. Hymie Gesser from the University of Manitoba. In addition, a special guest who is going to be speaking to us this afternoon, Mr. Axel Szelinski from the West German Government and finally immediately to my right is Mr. William Halpenny with the Manitoba Chambers of Commerce. Another person sitting before you I'm sure needs no introduction to many of you. It gives me great pleasure to introduce Mrs. Muriel Smith to you. Mrs. Smith is a colleague, a cabinet colleague of Mr. Jay Cowan who unfortunately could not be with us this morning but who will be here on Friday to close the symposium. Mrs. Smith is the Minister of Economic Development in addition to being the Deputy Premier of the Province. I would like you to join me in welcoming Mrs. Muriel Smith.

Mrs. Muriel Smith:

Thank you Mr. Chairman and Friends.

It is a great pleasure for me to be here with you this morning and to share in the opening of this symposium on Hazardous, the Disposal of Hazardous and Special Waste. As you know, my colleague Jay Cowan is the person who really should be standing here in front of you because I think if any one in the Province of Manitoba has earned the title of Mr. Protector of the Environment, it has to be Jay Cowan. Over the years in his political life and personal life he has taken such a special interest in these particular concerns. Now I think he asked me to come partly because he has known that I have shared his interest in concerns for many years but also because at the cabinet table my portfolio is responsible for Economic Development and Tourism. I'm often in the position of having to argue the pros and cons of protecting jobs and not killing businesses over against improving questions of the environment. And, I'll have you know that we are friendly protaganists in this debate because I think we are both committed to putting issues of health and environmental protection as bottom line issues. The question of how we phase in some of our protective approaches is a question that is open for debate so that we can recognize the dual demands, if you like, for jobs and economic stability, but our commitment to improving environment and acting responsibly in the area of protection is really, I think, without question. Jay is particularly sorry about not being here with you today. As you know he is in Ottawa attending the constitutional discussion with the Premier and the Attorney General. He is particularly interested of course in the results of this symposium and it is his intention to be with you on Friday morning for the conclusions of your deliberations. As I'm sure most of you are well aware by now, the Government last November announced its three phase Hazardous and Special Waste Management Program. The Program is founded on the principal of meaningful and effective public participation and public dialogue. The first phase of the program consists of a number of steps including this very important symposium. Also included in the first phase are formal Clean Environment Commission hearings expected to be held sometime later this year. These hearings will be convened around the Province, with the objective of

specifically determining site selection criteria for a treatment and disposal facility and determining Manitoba's requirements for treatment and disposal of hazardous and special wastes. In this part of the first phase, the Government also intends to introduce comprehensive enabling legislation to manage and control the present situation with respect to hazardous waste in Manitoba. A public information and awareness program is also being initiated. As well, the Department of Environment has already hired a Hazardous and Special Waste Management Coordinator. This Coordinator has already been busy travelling around the Province meeting with various groups and discussing this most important issue. Phase two of the program will involve site identification and selection while phase three involves the actual construction of a treatment and disposal facility. I would like to emphasize that this program is a major priority for my colleague, the Minister of Environment, as well as for our Government. It's our fervent view that we must plan our system for hazardous waste management now if we are to guarantee preservation of the environment for future generations. Manitoba is really in a very fortunate position in that we do not yet have an acute problem with hazardous waste so, rather than leave this issue to haunt future generations, now is the time to initiate our planning and ensure that we put in place a preventative program . As I'm sure most of you know as well, we don't have to look very far to see horrendous problems being experienced as a result of serious negligence in planning for hazardous waste disposals. In the United States for example, there are thousands upon thousands of hazardous waste disposal sites, both municipal and industrial, which are causing numerous problems. We in Manitoba want to avoid this Love Canal scenario at all costs. We owe it to future Manitobans to ensure that we take the necessary action now to institute a hazardous waste management system that will guarantee the preservation of our environment and protect the public health. We in Manitoba are determined to avoid passing on a legacy of environmental mismanagement and neglect. As I indicated earlier, public involvement is an important feature of our environmental program and this symposium is a key part of the public participation process. As a Government we will be listening very closely to the discussions and the recommendations emanating from this gathering. We will be incorporating your views into the future phases of our program. As

I'm sure most of you are aware, the symposium, while it's being sponsored by the Provincial Government, is being organized by an eight member, non government Steering Committee. The Steering Committee, as you will note in the program, includes representation from various sectors of Manitoba society. The Steering Committee has done an excellent job in organizing the symposium in such very short order. On behalf of the Province, I would like to thank each one of them for their very hard work and commitment to this most important undertaking. So, on behalf of the Government, I would like to thank you as delegates for attending this symposium. I am informed there are in attendance at this event participants from across Manitoba, from Emerson to Lynn Lake. I would now like to take my leave of you because we have a cabinet meeting already underway but, I would just like to add that I understand that along with an impressive array of speakers we have in attendance observers from other provinces in Canada and from the United States. You bring to this symposium diverse backgrounds - technical, professional, social and political - and I think that it is the interaction of all those different perspectives that is going to produce a workable and effective program for Manitoba. So I would like to welcome you all to Winnipeg. Hope you find the symposium of value and I can assure you that your participation is appreciated and I wish you well. It is a most important issue in Manitoba's future and thank you each and everyone very much for participating.

Bill Kennedy:

Thank you Mrs. Smith, Minister of Economic Development. I think I would like to start off, perhaps I should introduce myself first. My name is Bill Kennedy and I'm the Chairman of the Manitoba Environmental Council. I wanted to just start off with a few procedural notes about the symposium, for you, this morning so that we can get off on the right track. First of all, we're having, as you have seen on the calendar, a number of speakers presenting to you various experiences from elsewhere, from other provinces in Canada, from the United States as well as Europe. Tomorrow we're having workshops and that is where the participants here get to say their piece and we are looking forward to a good turnout in the workshops. I wanted

to just review quickly with you the package, the blue package that you each picked up, the information kit, just so that you are aware of what's in it and how you can use it to participate, I think, a little better in the symposium. (I will make a note to those people who are standing in the back that there are a number of chairs available at various random locations if you are interested in sitting down.) The kit contains an agenda, it contains a list of the workshop coordinators who will be leading workshop discussions in addition to the names of resource people from the Province's Environmental Management Division who will be working as recorders of the deliberations in the workshops. It also contains the green formal calendar of events, it has a special section outlining the basic purpose of the symposium as defined by the Honourable Jay Cowan and which was given to me as part of our Steering Committee terms of reference. There's also a Press Release describing the initial announcement about the Province's proposed program which we have heard a bit about from Mrs. Smith and will hear about in more detail from Dr. Bowen later this morning. Next we have a document in green which is the workshop program manual, that contains a basic statement about what the purpose of the workshops might be, it describes certain kinds of issues which our Steering Committee felt was important, the workshops are focused around sighting and transportation and long term safety and so on. So this program manual will be of interest to those people who are going to be participating in workshops. It contains a description of the kinds of issues the Province is interested ~~in~~ in getting feedback from us about. It also contains some biographical material on some of our speakers. I'll be going into some of that in more detail later on. And importantly at the back there is in your information kit a symposium evaluation. We're interested in the symposium being evaluated and your comments about how you feel the symposium went, what could have been done to improve it and so on. One of the goals of that is to try and plan better symposiums in the future. Which brings me to another item that I wanted to draw to your attention. As you may have noted in the calendar, this symposium is not directly addressing the issue of radio active wastes. The Province does indeed recognize, I'm told, that there is I guess a portion of our waste stream which includes low level radioactive wastes. The current policy, as I'm told by the Province on the matter, is that in their dealing with the

Federal Government they are trying to map out a policy and a strategy of what to do with and how to store and how to tabulate these kinds of radio active wastes and at this particular symposium our Steering Committee was not charged with the responsibility of dealing with that particular topic. I have a very strong hunch that one of the major recommendations coming out of this symposium will be a recommendation to the Minister that there should be a similar kind of symposium on the radio active waste matter. So I just wanted to make that clear, it's really not an oversight that they haven't been included. It's really a matter of another very important issue that will be addressed separately. Hopefully with a lot of public participation. Mr. Emberley.

Mr Emberley:

Mr. Kennedy as a point of order I think there's a number of us here who are frightfully concerned about the radioactive waste being deliberately omitted because they are basically the same kindergarten level of study radio active waste as there are study of waste as there are here today. We feel there are no reasons why it should be excluded. We ask you to make a special effort to be sure that there is an ad hoc seminar set up tomorrow to include radioactive waste whether it has the permission or not the permission regardless.

Mr. Kennedy:

Well I think we can accomodate that Mr. Emberley. I know that there are a number of people who are concerned about that issue. I believe that there is to be people from the R.M. of Lac du Bonnet and also perhaps from Pinawa itself, who may be here today. I would encourage, perhaps at noon you to approach me and get together and it may be that we want to set up a special workshop on that subject. And if that seems to be your wish then I think we can accomodate that in terms of facilities. I think perhaps just to clarify the Department's policy on that Ken, Mr. Emberley if I can just read you the policy and if you wish I can make a copy of this available to you. "At the present time low level radioactive wastes has been identified as part of the overall waste stream generated in the Province of Manitoba.

Federal-Provincial discussions are currently underway to determine criteria for identifying and classifying low level radioactive wastes (their abbreviation is LLRW and I'm going to try and use that although I'll probably forget) for storage and handling and disposal and for reviewing regulatory responsibility for LLRW. Until these particular discussions are completed and the above criteria established, LLRW will be considered separately from the Hazardous and Special Waste Management program. It is recognized that dependent upon the outcome of these discussions, (which are apparently ongoing) sometime in the future there may be a linkage between the two programs. There would be a full public participation program prior to any extension to the initial hazardous waste facility regarding any other waste excepted".

Mr. Emberley:

The pertinent part I believe sir is that the Provincial Federal Governments are establishing the standards of what they will consider low level radioactivity without public participation different from the regular waste, deliberately, which is always the way that radioactive and nuclear things are considered in this country and we wish to have public participation in the setting up of the standards which is a matter of great dispute and that is why we request the seminar. We thank you for your consideration of that possibility.

Mr. Kennedy:

Well I think what we're talking about doing or not doing is really going to take place tomorrow after the presentations have been made. I would really like to get on with the speakers because there are some here who are really interesting to listen to and I'm sure that many of you share that opinion. Why don't you come and see me at noon tomorrow and perhaps your point is well taken that it would be unfair to other people who are concerned about radioactive waste to hold an ad hoc workshop on the subject without them having been properly notified. I think we can work out the wrinkles of that with Mr. Emberley and his group. I would like to forge ahead and in doing so

I wanted to introduce one of our keynote speakers; a man who has a very impressive resume, a man who is a professor of occupational health at the University of Illinois who flew in from Chicago last night and I think has been on television ever since. He's a man, if you have read the recent newsweek article on hazardous waste in America, whose name has appeared first as one of the major experts in that particular field. The man I'm talking about is Dr. Samuel Epstein. He is the author of the book "Politics of Cancer" and a more recent book called "Hazardous Waste in America". It is a very readable book written for people like myself, the lay people in this particular field. The local Sierra Club, here in Winnipeg, do have copies of Dr. Epstein's book for sale, I believe, in the lobby (is that right Dennis?) just outside, so I would encourage you to browse through it and have a look and see if you would like to pick it up. In saying that, without further ado, I would like to introduce you to Dr. Samuel Epstein. Doctor....

Dr. Epstein:

Members of the Steering Committee I would like to congratulate you first of all on having organized this very important occasion and to thank you for having invited me to be the opening speaker. As I gaze at the faces of this audience and see some of the experts here I'm reminded of my favourite American presidential story. It seems that just prior to the last presidential election, President Carter, Mr. Reagan and Mr. Kissinger and a couple of passengers were returning from a public debate in a small town in New Hampshire. They were returning to Washington in a very small private plane and included, as I was saying, a priest and a university student. As they approached Washington, the plane started to behave in a somewhat turbulent fashion and a few minutes later the pilot came back and said "Gentlemen I've some bad news for you, we have developed irreversible engine failure and I propose to make my departure with my parachute and I'm leaving 4 parachutes amongst the 5 of you". Well immediately President Carter got up and said "As the President of the United States, the greatest country in the world" he said, "I'm entitled to the first parachute" and put it on and hopped out. Mr. Reagan got up and said "It is equally clear, that as the next President of the greatest country in the world (I have to be careful when I

say things like that, its pretty inflamatory isn't it?)"I'm entitled to the next parachute" and put it on and hopped out. Mr. Kissinger got up and said "As the world's greatest expert I'm entitled to the next parachute" and put it on and hopped out. The priest turned to the student and said "My boy I've led a good life in the service of the Lord, my time has come, take the parachute, my son, and jump". The student turned to the priest and said "Look, why don't we take one each and jump". The priest said "You don't understand. There were 4 parachutes amongst the 5 of us". The student said "Father, you don't understand. Mr. Kissinger has just jumped out with my knapsack". The moral of the story is, that not all experts are wise, and some matters are too important to be left to the experts, and that is why I particulary want to congratulate the Steering Committee for having focused so strongly on the need for citizen involvement in these issues. As you probably read, in America we seem to have made a frightful mess of these things, but whatever steps forward we're taking, whatever constructive steps we're taking, I think we're really taking in spite of government, certainly in spite of industry and only I think because of strong grass roots pressure thats providing necessary leverage. This is the theme which I will be developing in the course of my remarks in the next three quarters of an hour, namely, that programs of this kind are doomed to failure, unless they have the strong support and continuing monitoring and surveillance by grass roots. Now having said that, what I thought I'd like to do is to start off with a few general background remarks from my somewhat limited perspective in the United States and then proceed to a discussion of what I would call safer management of hazardous wastes. Now its fair to say that in the United States and elsewhere problems of hazardous wastes disposal and hazards of hazardous wastes have kind of snuck up on us without really being aware. The first law that was, actually even before that, in the late 60's and early 70's when the Congress of the United States was developing air and water pollution laws, and I was closely involved in this, in these efforts as a consultant to Senate Committee and Public Works, when we were developing the legislation, none of us really stopped to think about what would happen if we curved emission of hazardous waste into air and water, of hazardous materials and toxic chemicals into air and water, where was the material to go. Nobody really thought about where the material, the

toxic chemicals, were going to go if they could no longer be discharged into air and water. As a matter of fact, even in 1976 in the United States when they passed the first law, the so called Resource Conservation and Recovery Act, in which problems of disposal of hazardous waste were discussed, this bill, this piece of legislation was really regarded as a piece of garbage legislation which the major focus was just disposal of solid waste in which disposal of hazardous waste was almost an aftersight. It wasn't until the summer of 76-78 when Love Canal hit upon the public attention, the public media, that the issue of hazardous waste was begun to be perceived by the American public as a truly crisis issue. And by 1980 when there was a very large public survey, a Roper Survey, the survey concluded that the American public would not be willing, somewhere in the region of about 80% of the American public, would not be willing to live within 100 miles of a hazardous waste dump even if they were assured by Government that this was safe, what I would consider to be healthy skepticism, and by January of 1983, just 2-3 months ago, we had a Lou Harris poll and the poll made it clear that while, indeed, the average American, is opposed in principle to the abstract concept of regulation, when it came to regulation for health and safety of the environment as many as 93% of American surveyed demanded tough regulation, even if there was acclaimed conflict between this and jobs (this is my own view based on analysis on detailed economic literature that the conflict between employment and healthy environment is imaginary largely and is basically a defensive reaction of those who are being regulated). Now if you recall in the late 60's and early 70's environmental concerns and consumer concerns were largely the province of the white middle class, white collar liberal, and this created strained and social tensions because on the one hand you had the blue collar, you had the labour concerns and these concerns, very often, were pitted against the environmental concerns. As far as hazardous wastes are concerned, we see an issue by partisans that crosses socio-ecomomic barriers, that impacts as much if not more on blue collar workers and then on the so-called white middle class liberal and essentially what we are now seeing, in the United States in particular, is the emergence of a strong grass roots sentiment on this, which, as I said before, cuts across socio-economic barriers and is of a not politically non-partisan nature. And there is a

growing feeling that the issue of improper disposal of hazardous wastes is really a question of trying to come to grips, trying to control a runaway technology and this is really the number one environmental issue, certainly of the decade if not of the century. And I want to stress again and again that the real basis for congretional action now that we are seeing in the United States comes not from the scientific community, not from the regulatory agencies but from the public. Now just a few statistics from the United States to give you some reasons for, and some background for a level of concern before we get on to questions of management. In the United States currently we are generating about 85 billion pounds of hazardous wastes a year, thats about 3 hundred and fifty pounds per capita, for every one person we are generating 3 hundred and fifty pounds per annum. According to EPA estimates in 1980, the overwhelming majority of these wastes, somewhere in the excess of 90%, were disposed of improperly, unsafely and illegally. EPA estimates that there are somewhere in the region of 50 thousand hazardous wastes sites scattered all over America. The overwhelming majority of these haven't been started, haven't been characterized in terms of their content, in terms of their contamination of the environment, in terms of their public health impacts and even more so about 14 thousand of these are considered on the basis on currently available information to be potentially hazardous. Now if that weren't enough, in addition we have about 170 thousand of what we call industrial impoundments. An impoundment is a pond or a pit or lagoon in which industry has been dumping liquid wastes and sludges over the last few decades, in the open air and, in general, without any regard as to problems of contamination of surface waters and of ground waters. Over and above this, whenever any of these sites, any of these 14 thousand sites have been monitored, and very few have been monitored so far, we're developing increasing information on contamination of surface water and even more importantly ground water. It is estimated that about 1% of groundwater in the United States is now contaminated and in some part of Connecticut 25% of cities have contaminated ground water, in Long Island the aquafer is contaminated and there is talk in the not too distant future of people in Long Island having to drink bottled water certified organic chemical free. Now, if this weren't enough, there are growing public health data on hazards of

proximity of residents to hazardous waste sites, while indeed many of these studies fail to state scientific precision, we have information such as clusters of leukemia and cancers in Massachusetts, in Hamilton, Ontario and in the vicinity of hazardous waste dumps and elsewhere. It is difficult to obtain precise epidemiological confirmation but it is also equally clear that to insist on formal epidemiological confirmation of such varying data is basically an excuse for inaction, I must remind you that it took 4 decades of research to establish associations between tobacco and smoking which started on millions and millions of people and it is virtually an impossibility to obtain formal epidemiological data demonstrating the existence of unequivocal hazards in human populations as a function proximity of residence to industry but I should also mention that over the last 20 years or so, we have seen what is called data such as the Cancer Institute Maps which have demonstrated substantial excesses in cancer mortality as a function of residence in certain highly urbanized and highly industrialized counties. And a more recent study from New Jersey Medical College, a college of dentistry and medicine, has associated some of these excess cancer rates with proximity of residents to hazardous wastes dumps. Now if this weren't enough, lets talk just for a few minutes on the economics of the situation. It costs about 2 thousand dollars a ton to clean up hazardous wastes roughly in a hazardous waste dump, and in any one site the cost could range from 4 to 30 million dollars a site and these are somewhat conservative estimates. Let us say, we are assuming there are 10 thousand sites in need of a clean up, that gives you figures of 40 to 300 billion dollars. Now 300 billion dollars is roughly what the United States is spending on defence, for military purposes. In other words, we are talking about costs that approach the largest item in the GNP. In other words, not only is it not expensive to regulate, but the costs of failure to regulate are massive and inflationary although delayed. So when you are told it's too expensive to regulate, the answer should be it's far too expensive not to regulate. I've just spent last weekend in Missouri where I went as a consultant to a citizen group there and spent some time in St. Louis and Tanza Beach among some other places and I was reminded about an incident in which a farmer called Jim Denny living there in Verona, in 1971-72 was paid a $150 to bury a few drums of Dioxin sludge and waste on his farm. The cost today of

cleaning up the Denny farm are 2 and a quarter million bucks. The other great lesson you have to learn from America, particularly from American mistakes, are the promulgation of legislation, the development of laws, the creation of bureaucratic strategy, bureaucratic procedures for implementing these laws and charging government agencies with the discharge of these laws is really not enough. You've seen in the United States, we have the laws, we have Resource Conservation Recovery Act, we had Super Fund, we had Federal Agencies but in spite of this, what you have read in the papers is really just the tip of the iceberg in terms of sweetheart deals with industry, in terms of corruption, in terms of massive subversion of national political will to serve the short term economic interest of small segments of society. So profit by our mistakes, understand from us, that we cannot trust in goverment. Government is basically the last common denominator and government basically has a built in inertia and the best way of overcoming the human inertia in the system is to provide the grass roots leverage which will allow the most progressive and the most thoughtful elements in government. Already it's very clear that in this Province, you do have some extraordinarily thoughtful, extraordinarily concerned legislators, given them the necessary backing, support and leverage to be able to develop the appropriate legislation and to be able to implement the approriate legislation, and to be able to monitor the appropriate legislation. The Cowans and the Smiths are only as good as the support which you give them. They are fighting their battles too and you have to provide them with the necessary support. Now let me move on from those general comments to problems of discussion of disposal of hazardous wastes the so-called safe waste management. I'd like to consider those under three headings: The disposal and clean up of hazardous wastes which we have inherited, in other words, what do we do with hazardous wastes sites of the past, that's how do we clean up the past messes. The second, what do we do with hazardous wastes which are being generated at the moment and the third, what do we do in the future to reduce the generation of hazardous wastes, and that I think is probably the most interesting of all of the problems. Now, as far as past wastes are concerned, we are basically dealing with a clean up problem. We are dealing with the problem of failed toilet training of the chemical industry, unfortunately, and we have to embark on clean up programs.

And how do we do this? There isn't any one simple answer, we have to proceed on a variety of levels. The first is, to have a very detailed inventory of all sites in the Province where hazardous wastes have been dumped in the past ranging from so-called landfill, municipal landfills so-called secured landfills, incidently whenever we talk about secure landfills please put inverted commas around it . There is no such thing as a secure landfill. I'll be discussing this with you shortly, but a detailed inventory of landfills, so-called secure landfills and industrial impoundments is the first step and this information has to be public property. The right to know is synonymous with safe disposal of hazardous waste. Unless the community is informed of virtually all information on the hazardous waste area, except those highly restricted aspects which are claimed to be confidential by industry, and which claims are validated by impartial, non-interested attorneys so as to insure that the claims for confidentiality are not excuses for withholding information which properly belong in the public domain. Claims for confidentiality are massively abused and should be subject to the most rigorous investigation by independent attorneys. Now following the inventory of the sites, which I just talked about, what is needed is a very detailed monitoring program, to monitor problems, particularly environmental problems, which have emerged. Questions of contamination of surface water, questions of contamination of ground water, air pollution, in addition to that, attempts to try to come to grips with questions as to whether there are any public health problems in the local community and when I talk about public health problems in the local community, let us not forget that probably the most heavily impacted and affected individuals fall into the following two categories; either communities living on top or upstream or upgradient from a hazardous wastes site and secondly and perhaps even as importantly, are the workers who have been involved in the handling of hazardous wastes streams, in the transportation of hazardous wastes, in the disposal of hazardous wastes and who are now obliged to work in the clean up of these materials. Let us not forget that the worker in this country, as elsewhere, is the first to get the double whammy. He gets exposure at the job and also in some instances gets exposure at home, particularly if he lives in an area close to a hazardous waste site. Now its clear that you do in this Province and in

Canada, have laws which enable Federal and Provincial Government to act on the hazardous waste area although these laws were not specifically designed for that, and it's my understanding that in the not too distant future, you will have comprehensive legislation that deals with these areas. About the laws in themselves, they have to embrace a wide range of activities including the need for prosecution of offenders, the need for control, the need for security, the need for penalties, the insurance that industry doesn't do under the table deals with government, particularly with local municipal government that may have strong economic interests in the facility and to eliminate various loopholes and exemptions and to, among other things, ensure that communities and individuals that have been affected are compensated, they are compensated in terms of relocation, if necessary, for health effects and if they have been damaged, if their health has been damaged, that they are entitled for compensation. And furthermore the question of the burden of proof is very critical. If there is evidence, some evidence although not totally conclusive evidence of adverse health effects as a result of exposure to hazardous waste, wherein does the burden of proof lie, does it lie on the victim to provide all the necessary information to provide the experts, to establish without any question of legal equivocation that the problem was due to the hazardous wastes. I would suggest no. I would suggest the burden of proof has to be shifted on the polluter, not on the victim and this is a sentiment which is gradually achieving acceptance in the United States Congress that the burden of proof has to be shifted. Now when we talk about compensation, when we talk about some of these things, we are talking about costs, we are talking about budgets and the question is who is going to pay for this. In the United States, the solution there, was to develop what is called the Super Fund, a fund which industry, the industries concerned pay about 90% and State Government pays the rest. Something of this kind has to be developed but it is clear that there has to be some tax on industry for such clean up activities. This Province will not approach costs which we are seeing in the United States when it is becoming now necessary to relocate total communities and we are really faced with situations of communities being turned into ghost towns. What we have so far in Times Beach and Love Canal is simply a pressage of crisis to come. Now, let us talk very briefly about what we do for

hazardous wastes at the moment. Hazardous wastes we are generating now and I think perhaps the most important point to appreciate is, that there is no such thing as a secure landfill. A secure landfill is a hole in the ground in which chemicals and waste materials are dumped and lined, the hole is lined with some material, liners or plastic liners or clay or what have you and its capped hopefully so that the material doesn't escape into air, into surface waters and into ground waters. Now I'm not saying that if one is willing to spend vasts amount of money, literally vasts amount of money, that you cannot produce a hermetically sealed hole in the ground which will prevent leakage of materials for decades if not centuries, I'm not saying it can't be done. Of course it can be done but the amount of money that has to be spent to do this, makes it so prohibitive that it's really not worth considering. For instance, let me just give you some ideas of costs. Its costs about 5 bucks a ton, as a general kind of figure, to dump stuff in the hole in the ground, average cost of transportation, digging a hole etc. For so called secure landfill, costs can go up to about 80 to 85 dollars a ton. So you may be spending a lot of money and in addition to that, it does in no way guarantee you that you will not be faced with substantial additional costs from air pollution, from water pollution, surface and ground water pollution, from public health effects. So you can be spending a lot of money and still not be sure that you will not be having major problems in the not too distant future. Incineration, costs of incineration are from 100 to about 500, 550 dollars a ton. We will be talking about that shortly. There are some other methods of disposal which actually save money but again we'll come to that in a few moments. Now, its interesting that the comments that I've made on the unsafeness of secure landfill are not only my own personal viewpoint, they are viewpoints of a growing number of scientific colleagues in the United States who studied these matters in great detail but has become the accepted position of a wide range of leading political figures in the United States. Governor Gerry Brown of California, with who I had the pleasure and distinction of working on problems of toxic substances, particularly questions of right to know in California, took the position on the advice of his office of appropriate technology, that it is improper to bury hazardous wastes in the ground and within, particularly liquid hazardous wastes in the ground, within a short period of time, the use

of so called secured landfills was to be phased out in California. Governor Bond from Missouri, not exactly one of the most progressive States in the United States, recently proposed at, made a proposal which was passed by the National Governor's Association of United States to phase out the use of secure landfills. Governor Thompson, a somewhat conservative republican from my own State, has similarly made this statement that by the end of this year we hope to phase out the use of secure landfills, particularly for most categories of hazardous wastes including liquid toxics. Dow Chemicals, one of the most intransigent of all chemical industries in this Hemisphere, wanted to delay the passage of toxic substances control in 1976 and fought tooth and nail against every major attempt to regulate the industry, has taken the position that there is no such thing as secure landfills disposal, its just a method of storage hazardous wastes and not a method of disposal. So there is a strong body of opinion, political besides scientific, that secure landfill is not the way to go. I don't have time to go into details of this and all the reasons for this and if some of you who want to take a look at my book will find further information on this. O.K., but let us say then, that you don't want to go the route of secure landfill, what do you want to do then? What options are there? And it's clear that there are a wide range of options. And these options, the so called alternative technologist fall into 4 categories: incineration, pre-treatment, recycling and interim storage. Let's first talk about, and incidently one of the very interesting things that is happening in the United States and also in this country, is the emergence of industries and industrial groups that have the technological innovation, that have the imagination, have the foresight and also very, very recently the entrepreneurial instinct to realize that there is money to be made in safety, in safe disposal hazardous wastes. And in fact, in the United States we now have in Washington a lobby called the Hazardous Wastes Treatment Council which is a group of industries that have banded together because they are opposed to secured landfill disposal and they are advocating and selling other technologies. And that's what the capitalist system is all about. Good luck to them. Now, incineration. When we talk about incineration you have to understand we are talking about high temperature control incineration. High temperature control incineration is theoretically a safe method of disposal of

all hazardous wastes with the exception of heavy metals and materials which are basically nonflammable. Any hazardous wastes stream that contains under 25% of nonflammable can be incinerated with high temperature control technology safely and of course any hazardous wastes streams containing heavy metal cannot. High temperature control incineration is really what it says, combustion at high temperatures which will break down all organic material ranging from dioxins to trichlorethelyne. Now, that does not mean to say that high temperature control incineration is safe. Its safe when done properly and unsafe when done improperly. First of all there are accidents. Accidents happen and happen more frequently then less frequently. For this reason incinerators, high temperature control incinerators, should be located at least 20 miles away from any populated area. High temperature control incinerators should have continuous stack monitoring, the stack should be continuously monitored and the stack emission data should be made available to the public and there should be an automated shutdown whenever uncombustible material passes the stack monitor. Let me tell you, there's ways and means of cheating and I'm particularly interested in some of the things that are happening at high temperature control incinerators in the United States. There is one very large incinerator which is being looked at which has the following pattern: by day everything proceeds as it should do but by night, five times the amount of material combusted by day is burned by night. What's the reason for this? The reason is very simple. The manual. They bypass the manual override and burn material at low temperatures so at night the unburned PCB's comes out of the stack and the unburned dioxins and what have you comes out of the stack. So I repeat, high temperature control incineration is safe but locate these at some distance from any populated centre, have continuous stack monitoring and emission data, perimeter monitoring, make such information available on a continuing basis to local communities, have an automated shutdown and watch the technology very, very carefully. The cost for high temperature control incineration ranges from 100 hundred to about 600 hundred bucks a ton. The higher cost you see when you are dealing with highly corrosive acidic effluence, and the lower cost when you are not dealing with such effluence. Now, the next type of, and incidently we reckon that by the use of incineration, one can probably take care of to about 30 to 35% of all

hazardous wastes. It is very difficult to have meaningful figures of this kind. These are overall figures because the actual figures will depend on the nature of the hazardous wastes stream because each of these disposal techniques tend to be process and product specific, so I'm talking about very loose generalization only. The next technique is what's called recyling, the recycling technique. Recycling is basically a method of, by which it is a process by which hazardous wastes streams, in other words, the wastes of one industry is either regarded as a resource for that industry, as an economic resource for industry to recover and recycle or resource which can be sold to another industry. Now, how is it that we are doing so little of this, now in the United States. Hazardous wastes exchange and hazardous wastes recovery amounts to, accounts for about 1%, 1-2% of all hazardous wastes disposal in the country. And there are many reasons for this. One of the reasons is, what I call, the Kissinger Syndrome coming back to the Kissinger story. I don't know if you remember the very funny story of when Kissinger was Secretary of State, a couple of enterprising Washington reporters dressed up as garbage men and collected his garbage which he put out every morning at George Town, his apartment, collected it for a whole week and examined it. The idea is if you are looking at a man's garbage you can really reconstruct his lifestyle. Well, Kissinger sued them, he was absolutely right for invasion of privacy. Anyway the case was settled out of court. However, the same feeling that if you examine my waste, you have access to my secrets, the same feeling is common particularly in industry in the United States. When you compare hazardous wastes exchange, resource recovery and recycling in the United States and lets say West Germany, Sweden and Japan, you see that there is very, very much more activity in these areas then in the United States. I have no doubt, that in the not too distant future, when the people realize that there is a lot of money to be made in the hazardous wastes exchange that the whole process will become far more efficient. But at the present moment, hazardous wastes exchange and recovery and recycling is only being done in a minuscular fashion. One of the reasons for this is because it is much cheaper to dispose of wastes yearly, to pour them down sewers, to pay somebody to get rid of that stuff no questions asked. Until you can come to grips with the situation, until you can control the situation, until you can tax secure, so

called secured landfills, you will not provide the necessary market place pressures to stimulate the emergence of some of these alternative technologies. The next kind of technique is what is called pre-treatment. There are a series of chemical, physical and biological methods by which you can take individual wastes streams and treat them in such a way as they become more amenable to either incineration or resource recovery and recycling. And again, these techniques have been well worked out. Many of them are still at prototype stage and they could in fact achieve major improvement and efficiency of disposal of hazardous wastes giving a shift in the whole economic climate. Then you are left now even with pre-treatment, incineration and resource recovery, you are still left with a residue of hazardous wastes which we can't get rid of at the moment, perhaps 20-25%. And its probably going to take up to a decade or so before some of these other alternative technologies are geared up sufficiently to be able to adequately handle more hazardous wastes. Now what do you do with these materials in the meantime? Do you put them in a hole in the ground? Do you put them in secure landfills? The answer is no. What you do, is you put them, you create what is called interim storage services and these are based on the nuclear field, the new RRSF. That's Retrievable Storage and Service Facility and I'm quite delighted by the comments which were made earlier this morning that we should include, if at all possible in the workshop, discussion of disposal of nuclear hazardous wastes streams. Certainly I can't conceive of any reasonable objection to public participation in the standard setting process. And let all who want to come, come and share their concerns. The whole idea that it has to be formal notification in advance so that every interested party can come, really smacks of legal defensiveness and I think such attitudes are singularly inappropriate when dealing with major public health concerns. But let me get back to the interim storage question. Interim storage site really is, says the following: we don't know what to do with these materials now, we don't want to risk dumping them in the ground and contaminating surface waters and ground waters, let's build an interim storage site, interim storage site are above ground concrete mausolea which basically have a life span built into them of 10 years or so, 10-15 years, in which you put material, you could monitor very carefully so as to prevent any leakage or leachate and the

material is stored temporarily in these sites. You attempt, as far as possible, to compartmentalize, you compartmentalize by having different compartments in these mausolea for different kinds of wastes stream for ease of recovery at a later stage. One of the greatest problems in disposal of hazardous wastes is co-mingling of waste streams. The more apart you can keep different kinds of wastes streams, the easier it is to manage, the easier it is to recover and recycle and to do various other things with them and this is a concept of interim storage I think is terribly important. Incidently, when we were talking about secure landfills, one thing I did neglect to mention was the whole idea of incapsulation. Some of the interesting, there's been some interesting studies in the United States and elsewhere on variations of so called secure landfills called the incapsulation techniques. In the incapsulation techniques, liquid toxic wastes and others are incapsulated and ceramasized and built and converted into rock like, semi-rock-like materials which is then claimed are relatively safe to be disposed of. Studies in Holland and elsewhere have suggested, experiences in Holland and elsewhere have suggested that basically all that happens when you are incapsulating is just delaying the problem a decade or so. And you are delaying the needs for monitoring a decade or so till these materials break down. So I would say that incapsulation, while certainly a technological improvement, is really not an answer. Now, having talked about some these problems of safer technologies, I think it is also fair, necessary to point out, that we are talking really about a dual system. We are talking about an on site system to industry that, we are talking about the need to ensure that industry disposes of its own wastes on site, in an environmentally acceptable fashion and also and of course, this can be done by big industries that have major resources and can have an on site high temperature control incinerator. But, the functioning of this incinerator and information relating to the functioning of this incinerator has to be public property because if its incinerator puts out uncombustible materials it is the local community that will be breathing it in. So the community is entitled to have information on continuous stack emissions data from industry incinerators. In the same way, it is my position and the position of a growing number of United States scientists besides politicians, that a community is entitled to know what toxic chemicals and

what chemicals carcinogens any industry in their community is handling and manufacturing because any industry handling and manufacturing a toxic or carcinogenic chemical will be putting out that material into the environment, into the air and the water of that community and there is a vast amount of monitoring data to demonstrate this. I could spend perhaps the next day reciting specifics of monitoring data in relation to vinyl chloride and a wide range of other chemicals demonstrating that. There are major hazards in residing in proximity to a wide range of industries of chemicals and otherwise. So the right to know is the critical issue here. Now as far as off site facilities, it is necessary that once you have facilities which are available to dispose of wastes from small industries, small business, and from consumer waste streams and some other sources, what do we do with these? Well clearly what you need is regional sites. You can't have dozens of small high temperature control incinerators all over the place. You need to focalize these disposal sites into certain regions where you can have high technology, where they can be under continuing surveillance and where problems can be encountered and recognized. And it is critical that these can be located at a major distance from populated areas and be subject to, as I said before, to ongoing monitoring. There has to be in addition, the immediate institution of a foolproof manifest system so that any industry generating wastes has to be able to give information on the specifics of where the material is transported, and specifics of where it is disposed of. The whole idea of get rid of the stuff, we don't really want to know, is unacceptable. The industry that generates the wastes has the responsibility to ensure safe transportation and safe disposal and a detailed foolproof manifest is absolutely critical. Control and security, monitoring and the right to know, inventories as I mentioned before, are all critical issues. And the manifest has to cover the generator, the transportor and the disposor. There is just one other area, which I don't know whether this impacts at all on Canada, but it certainly relates to America. In America, there is a growing delightful sidelight of hazardous wastes stories apart from the involvement of the crime syndicate. Particularly in the New Jersey area is a willingness to solve our problems at other peoples expense and there has been in the last decade or so an extraordinarily regrettable tendency to export hazardous wastes to the so

called lesser developed countries. This is another example of that which I'm sure you will fail to emulate. Now, let us now look into the future a little. What do we do about hazardous wastes in the future? The basic answer is not to generate them. Well, that sounds like simplistic nonsense but I would like to show you that it isn't quite so nonsensical as it may seem. Now, what I want to talk to you about now is, I want to move away from narrowly defined technological solutions, 'cause up till now what we have been talking about is engineering technology. I would like to move away from this and to make it clear to handle the whole question of runaway technology in general and hazardous wastes disposal in particular, we need to have a blend of wisdom besides expertise, we need to incorporate nontechnological options with the technological solutions which I talked about. Now the, before getting into some of these, I want to make it clear that the encouragement of safe alternatives to secure landfills disposals has got to be an ongoing activity which is going to become even more marked in the future way we handle hazardous wastes. And I don't think that any government regulation and legislation, citizen activism alone is going to be enough to encourage this safe technology. What you need is to allow the market place, market place pressures, market place economics to come and to shift the scene. We need to tax secure landfill disposals, we need to make secure landfill disposal even so expensive that the recalcitrants in industry will be overcome and also to encourage those more progressive elements in industry. There are many, many such progressive elements in Canada, in particular, that are already interested in safer disposal but need the economic incentive to proceed along this direction. So if on the one hand you tax secure landfills and on the other hand you provide subsidies and economic incentives to some of the available alternative technologies and to encourage those technologies which are still at the prototype stage, you then allow market place pressures to enter into the scene. Don't forget that the technological genius of industry in this hemisphere is massive. We're really dealing with an extraordinarily inventive industry and an ingenious industry that up till now has focused most of its concerns on short term economic interests. If only one can help and nudge a fraction of these concerns in the direction of developing technology to be consistent with long term sociable interest then I think we'll proceed a

long way in the necessary direction. Now, so what in fact I want to be talking about is the mixer strategies. The mixer strategies will include the legislative, the regulatory, the economic, but, all of these in the final common analysis will depend on strong grass roots support and this support has to reflect, among other things, the high so called externalized costs of failure to regulate. The cost of failure to regulate, and we've discussed these numbers briefly before, are massive and inflationary. We cannot bear these costs, from pure economics, quite apart from the fact that once we contaminate our ground water we are contaminating a priceless heritage of the lifeblood of this earth and it's basically an irreversible process. Let me try now to focus attention on the initial remarks I made talking about future disposal, on reduction of generation of hazardous wastes. Is this feasible? I would suggest that it is feasible in the following ways. There are certain chemicals, firstly, which are so toxic and so hazardous that there are substantial questions as to whether their use can be any longer justified. Now this of course is a difficult area, an area which we have to come to grips with; but, there is a body of opinion, the Editorial Board, there is a body of opinion which is coming to the conclusion that there are certain categories of materials which are too expensive for society to use. And the Editorial Board of one of the major leading newspapers of this world, which I will not identify for you, is now busy. One of his major priorities is engaged on this extraordinarily difficult question of whether the Board can throw in its support, for the concept that certain classes of chemicals are just too expensive to be used. Amongst such categories of chemicals I would include chlorohydrocarbon solvents, trichlorethelyne per chlorethelyne and also chlorephynoxy compounds, 2,4,5T, 2,4D. I think these materials, the problems in their use, the dioxin comtaminants, are so expensive in terms of public health cost, in terms of environmental pollution, that I don't believe that we can afford to bear these costs any longer and I think the costs of using them safely, I don't believe one can to all intent and purposes use these compounds safely, so there are real questions whether society can afford the externalized costs any more. But more than that, I think that for toxic chemicals in general, it has to be a series of economic incentives which will discourage their use and encourage the use of alternatives. And let's discuss

this a little. In an attempt to encourage industry to use less toxic chemicals from particular products and processes, one could add to the following: to have a user tax, everytime a toxic chemical with certain defined characteristics is used, industry has to pay a tax which will reflect the question of the monitoring of that chemical in the workplace, monitoring of that chemical which comes out and may come out from the local stack into the local community and monitoring for disposal of that chemical. So, a user tax and a disposal tax will immediately create economic disincentives for the continued use of those chemicals and at the same time one creates, one uses that money to create subsidies for alternative products and processes. And there are a wide range of alternative products and processes. The whole question of the use of biomass as a source for organic chemicals, besides for fuel, is in its infancy, the economics of the use of biomass for the production of chemicals and, incidently, when you use biomass agricultural wastes you don't get left with petroleum wastes which are one of the major sources of hazardous wastes streams in this country. So the whole biomass technology is absolutely in its infancy. One could make regional biomass fermentation operations where you could produce a very wide range of organic chemicals without the whole petroleum wastes. And while the economics at the moment are somewhat unfavourable, the economics could be made far more favourable by the use of user taxes. Asbestos can be replaced to many uses by cyntodine, man made mineral fibers, chlorinated hydro solvents can be replaced by the use of ultrasonics, by the use of soap base detergents, PCB's can be replaced its many uses by mineral oils and so on and so forth. Many of these replacements in some instances may be more expensive for initial costs but for total costs in terms of externalized costs they can be very much cheaper. So in other words what we are saying is, create economic disincentive for continued use of toxic chemicals, create economic incentives for safer products and processes, subsidize recycling, subsidize process and product substitution, subsidize technologies like biomass. Now all of these approaches can be done within the framework of modern industrialized technology. I'm not talking about small is beautiful and thorough like return to nature, I'm talking about maintaining the basic structure of modern industrial society but giving it a nudge, so that we can control technologies

which have clearly run away from ourselves. Basically, I think its clear to state, that when industry uses toxic chemicals, toxic and cancer causing chemicals, and chemicals that produce other adverse effects, there has to be a series of very rigid requirements built in . The first is, the requirements for efficacy. Does this chemical achieve an important sociable objective? Does the product based on this chemical achieve an important sociable objective? And you'd be surprised in many instances the answer is no. Take for instance pesticides aldrin and dieldrin. Aldrin and dieldrin were pesticides used and they were cancelled and suspended by EPA in 1974. The major use of aldrin and dieldrin was for the corn root infestation and at court, when it came to the court proceedings, Shell, the major manufacturer, was unable to produce any evidence of efficacy because the major insects against which aldrin and dieldrin had been used had been resitant to the insecticide for over 15 years and Shell knew it. And at court, Shell was unable to produce evidence to the contrary and in the meantime not only were the farmers being gypped, being sold pesticide which they didn't need and wasn't useful but also aldrin and dieldrin had massively contaminated the American environmental scene. All of us in America and you in this country have aldrin and dieldrin in your body fat. It produced major fish kills, major poultry kills, major contamination of surface waters. All for what? Any evidence of efficacy, not on your life. The next question has to be asked, when industry wants to use a toxic chemical and in fact produces evidence of efficacy which is important, society important, we need the material and the next question is, are the substitutes which are equally or similarly efficacious but which are less hazardous or non hazardous, and this is a very important question. And in many instances you will find the answer is oh yes but we could do this but that is more expensive. Ha! Ha! More expensive to whom? Is the question, more expensive to society or to the short-term interest of that industry? That's the question. The next question is, if you want to use a toxic chemical and you say you want to manufacture it from raw material from petroleum fractions, why do you want to do that? Why don't you recover it from the waste stream, the waste stream from some other industry? So in other words, any industry that says "we want to use this material because its efficacious, there are no alternatives" you say to them

"why manufacture it why not recover it"? Say, you impose a tax on the manufacturer of toxic chemicals from virgin materials if that toxic material is present in a waste stream. So in other words, you create economic incentive to the resource recovery and recycling. You know, I'm just reminded of the debate in the United States on the whole vinyl chloride story, when we removed to one part per million, chloride standard which was passed in 1975. In 1974, the Petro chemical industry was complaining about occupational safety and health administration's decision to move in that direction and it had economic impact analysis done which came back saying if you regulate bichloride one part per million its going to cost the country 92 billion dollars and 2.2 million workers will lose their jobs. I thought, good Lord perhaps we should lose a few thousand American workers, we perhaps can't afford this, can we? You know its work has to take its risks and that kind of thing, however, what happened is extremely interesting. The one part per million standard was passed, was promulgated in Spring of 1975, within 4 months B.F. Goodrich, the major VC PVC manufacturer came into compliance at a cost of 35 million dollars, don't mark million now, the costs were estimated to be 92 billion dollars. Six months after that B.F. Goodrich was making money by leasing its compliance technologies to other industries and by recovering and recycling vinyl chloride which previously went out through the stack into the whole community, people in the whole community were breathing this extraordinarily expensive chemical and also workers were breathing this extraordinary chemical, the stuff was being wasted and in addition to stack emission control, vaccum stripping technology was introduced to pull out unreacted VC from the PVC and the industry suddenly started becoming more profitable and since '75 the VC PVC industry, as a result of these technology-forcing regulations, was growing at a rate of about 15% per annum, when much of the chemical industry was only moving about 4-5% per annum. You should look, I was recently looking at a radiant study, corporation radiant study of petroleum refineries on the west coast. Any idea what the percentage of valves and flanges leak in the average petroleum refinery? About 27% of all valves and flanges leak, putting out petroleum vapor into local communities. 27%! A count study done for EPA . So we are talking not only about major public health costs, we are talking about major economic losses

and to say that an industry loss isn't enough because a loss to industry is reflected by an increase in consumer products to ourselves. But coming back to that question of use of toxics, when industry does pass these requirements for efficacy, for nontoxic substitutes, for absence of resource in the waste stream, there has to be a cradle to the grave technology, there has to be information from industry as to what safeguards are being taken, from the moment that chemical is being generated to the momement it is finally destroyed. And what we need also is material inventory, material balance study. I recently looked at, again when we are talking about VC PVC I recently looked at a plant in the east coast, a VC PVC plant, in which one could show, by material balance study, incidently material balance study is very simple. You find out how much material comes into a plant, you find out how much leaves the plant, what difference between the two is material that's lost. Where is that lost? It goes up into smoke stacks, points source, fugitive emission and what have you. At this particular plant we looked at, losses of about 7% of VC per annum into the local community, thats 7% of the total VC material vinyl chloride was lost into the community. Massive economic losses, major public health effects some of which cannot be fully appreciated. The bottom line of all of this is, my understanding, that this conference was organized to insure participation of the intelligent citizen, intelligent layman. All that we have talked about so far and all that you will talk about is really hot air unless you, the citizens of this province, of this great province, will educate yourselves in these matters and believe me the issues aren't terribly complicated. When you're told by some several experts, look you don't really understand, the issue is too complicated, what he really means to say is, I don't want to explain it or I don't understand it myself. If you can't understand it nobody else can. So it's not your problem if you don't understand it. So, educate yourselves, inform yourselves and realize that these matters are far too important to be left to the experts. Learn from American experience that all the laws in this world, all the regulations, all the legislation are meaningless without your informed consent, and without your continued and ongoing monitoring and surveillance. Thank you.

Mr. Kennedy:

Thank you very much Dr. Epstein. Very thought provoking presentation. I think you may notice that we are running a little bit behind schedule. I would like to propose just a very quick coffee break and before a five minute coffee break I would like to take a couple of questions for Dr. Epstein. Just a couple of short questions.

Dr. Epstein. This is the most important area really if this environment is to survive. At the end of that film that is being blocked by President Reagen, "If you love this planet". have you heard about this, the last line says about nuclear arms..."If this problem isn't solved, no other problems is going to be solved. There won't be any chance to solve them."

Dr. Epstein:

I couldn't agree with you more. I really should have said second to the threat of nuclear annihilation. This is the number one environmental issue I quite agree. Thank you for the correction.

I wonder if I've got a short clipping here on a microbe that eats agent orange here? The work was done by a Doctor Checkovarty at the University of Illinois and I wonder if Dr. Epstein is familiar with this gentleman?

Dr. Epstein:

Yes I'm very familiar with these studies. There is no question at all in the laboratory and the test tube you can use, you can train a variety of bugs to break down dioxin. To all intent and purposes however, this use is not applicable to large scale contamination of soil and of waters. It is unlikely that it will achieve that particular purpose. It may well be used to define wastes streams however, prior to contamination to the environment and it is possible that this could be used at, so called at the end of the pipe for highly restricted dioxin containing wastes stream.

Whats the limitation at the other end?

Dr. Epstein:

The limitation is basically one of pragmatics. For instance, once you have several acres of soil or many streams contaminated with dioxin, there is no possible way you can harness them. If you could have a holding tank coming out, which is being fed by a pipe coming from industry in which you have a dioxin solution, provided there are no heavy metals which are highly toxic to the bacteria, then it is possible that one could develop the Checkovarty kind of techniques to,at a more practical level

Thank you.

Not counting military installations, is, are there government agencies that impose a note of secrecy on their activities? Why would this be necessary?

Dr. Epstein:

Well you know, there's a British tradition, you probably guessed by my accent that I'm not a native American, but the British tradition that Nanny knows best and one of the, and in other words put you trust and your faith in government and if there's anything wrong we'll tell you. One of the great difficulties in Canada as opposed to the United States is there are, the citizens have difficulty in laying his hands, his or her hands, on information. You don't have a vigorous, aggresive media that are steeped in the principles of investigative journalism. I'm not mocking journalism like we have in America, you have libel laws, you don't have congressional committee systems in which you can force agency officials to come clean and to be interrogated. You have no political differences in the way information is handled in this country and in England, from the United States and in this respect, comparison are always terribly invidious. In this respect I must say I feel far more comfortable with the openness of the system in the United States in which the citizen can obtain information. Do not misunderstand me,

you know, I think America has got a great deal to learn from Canada in many many ways. You don't have the same latent violence in this country, you have many many things and this isn't the time and place to make national comparison but when talking specifically about the problems of information, you are crippled in this country by government secrecy, by the close tie in between government and industry and by the exclusion of the public by the tie-in of University academics into the system. You are really dealing with a closed old-boy network. That's the problem in Canada.

Mr Kennedy:

Question Sir? Then we'll have a coffee break.

I'm interested in some recommendations as to our local problem, which is the extensive use of pesticides and herbicides in this City. A number of people have been dying because of the use of them and there has not been adequate studies and I'd like to know what we could do about it?

Dr. Epstein:

I can't really comment in an uninformed way on that because I don't know the specifics of what pesticides are used and I would care to guess that you probably don't. I think that in any community when any materials are used which are either toxic or suspected of being toxic, the community has the right to know of the precise identity of such materials, the community has rights to have formal hearings as to whether there is a requirement for such use as opposed to an alleged requirement, as opposed to a captive market and the community has rights to examine all information on toxic, on alleged toxic effect to be told by some faceless bureaucrat if there was any problem we'll tell you about it, is just not acceptable. We're dealing with 20th century democracy. You people aren't idiots, you are entitled to the information. You are not to be shrouded off by any linkage between government and industry that if there was any problem we'd tell you. Herbicide is a highly hazardous material, 2,4D and 2,4,5T in my view should under no circumstances be used in any populated area and if they are being used, citizen action is required to prevent their use. There is data coming out of your ear holes on the

hazardous effect of these materials and the only people who really deny such data are those who are economically linked to the industry. I think you will find, in the congressional hearings in the United States in the not too distant future, growing evidence of Dow's pollution of the environment with dioxins and Dow's close linkage with government, particulary with EPA officials, in an attempt to repress and supress such information. The times for such under the table deals are past. You are entitled to know what goes on in your home, in your community and in your society.

Bill Kennedy:

Mr. Epstein, perhaps you could ask it of him directly. We're going to take a very brief coffee break. Dr. William Nicholson will be coming on prior to Dr. George Bowen. This is in order to facilitate Dr. Nicholson catching his plane, which is leaving from the Winnipeg International Airport at 1:15, so that's a critical deadline and I've asked Dr. Nicholson in to proceed right away. I want to, by way of introduction, just give you some biographical notes on Bill Nicholson. He comes from New York. He's currently the associate professor of Community Medicine at the Mount Sinai School of Medicine, a faculty that I'm sure many of you people have heard of before. He's also associate director of the Environmental Sciences Laboratory. His expertise in work is in the area of Occupational and Environmental Disease, an area that is called epidemiology. Dr. Nicholson is currently on the United States Consumer Products Safety Council and in that capacity is the Chairman of the Hazardous Waste Advisory Panel. He's also associated with the EPA on a review committee on Hazardous Wastes Risk Assessment. I think some of these credentials will indicate to you that he is certainly a man we want to hear from. Without any further delay I would like to introduce Dr. William Nicholson to you. Dr. Nicholson

Dr. Nicholson:

Thank you very much. I'm very pleased to be here and to see the activity that is taking place in Manitoba towards the control of toxic wastes. The program outlined for your activities firstly here today and for the next two days and subsequently over the ensuing months is, I think, an admirable way for public policy to be made and I commend you as did Dr.

Epstein for it, and wish you the best in that regard. What I would like to do is actually spend my time discussing some of the health issues that are related to toxic wastes. You heard from Dr. Epstein on some of the problems that have been manifest in the United States. Could I have the first slide, I will just review briefly one slide I have. I had several but he has mentioned them. On that, the number in the United States that are potentially hazardous is enormous, 32 - 50 thousand perhaps . Overall we have something like 250 thousand dump sites overall, one for each 1 thousand people, so there are a very important commodity in our country. But the disturbing feature of this is that, this slide is about 1 year old, there is remedial action only being taken in 169. To initiate action once something is in place, once the hazard has been identified, requires enormous efforts and enormous amounts of time before finally something is accomplished. The costs of course are enormous. You've heard estimate of hundred million dollars or more for Love Canal. The EPA's recent ventures into the real estate of Times Beach look like it will cost, just in the real estate alone, 30 million dollars. So prevention I think is the ideal, if one can deal with the problem before it reaches these magnitudes, one is certainly well off. But let us look now at some of the problems that exist from what we have in place and what we are trying to prevent. There are a variety of effects that can ensue from residences near toxic waste sites. Work on that by the individuals employed in the disposal of the waste and others that may be affected in transportation or otherwise. Firstly, probably and a prime concern for most people, is the risk of cancer. The agents that are involved often are carcinogenic. In many agents that are being disposed of, may be carcinogenic and we do not know of it. At the present time there are about only 200 compounds that have been adequately tested in animals to be shown to be carcinogenic. There are thousands more that are potentially so, but for which we have inadequate information at this time. Further, of those compounds that are shown to be carcinogenic in animals, data exists on perhaps about 20 that have indicated that have carcinogenicity in humans. Human data is much more difficult to come by then animal data. We must observe large populations over long periods of time and some of the problems in identifying risks in humans all allude to in a short period of time. Secondly, concern clearly exists over birth defects and

miscarriages. These may be from teratogenic effects, from exposure to women who are pregnant at the time of exposure, there may be genotoxic effects that would lead to subsequent birth defects or miscarriages. Going down the line of, we now know that there is possibility of concern, chronological changes in population exposed to toxic agents, our bodies defence mechanisms, the lymphocytes can be seriously affected . Fourthly, neurological changes are known to be associated with many of the materials, particularly the solvents that are in the toxic wastes dumps and I'll speak briefly about that also. And finally, there are a wide variety of alterations that can occur: dizziness, headaches, unpleasant experiences that at least at the lower level of exposures may be reversible, unfortunately some of them lead to neurological changes if the exposure continues. But probably the first manifestation of concern from a toxic waste site are these so called reversible changes, that people experience directly from the residence and proximity to that and finally, even at a lower level one may have actual alterations in which the individual may not be aware, body burdens of materials that could have some potentially toxic effect. This high hierarchy effects is of importance to bear in mind when one is looking at the health consideration that may be manifest from various circumstances. The awareness unfortunately occurs at the lower range of these, lower range in terms of severity of human affects, the unknowns are at the higher range, where the effects are far more deleterious. The next slide, oh! I've got the slide. Let me look at some of the issues that relate to the issue of cancer. What we know about cancer, what we know about how the various agents produce it and the concerns that must exist when we are considering a cancer risk from, in this case, a hazardous wastes site. One of the very substantial items of information that we have is that cancer risk is a risk that rises very rapidly and over a very long period of time. It does not appear shortly after exposures to something, it occurs many many years later. If one considers the cancer burden in the United States and North American population roughly one in twenty, one in five death, 20% occur from cancer and it is estimated that of the 20%, 90% is probably related to exogenous factors, from exposures that the persons receives through his, through what he breathes, through what he eats, through what he is exposed to otherwise in the environment. But here the

time distribution of death from cancer of several sites virtually all of the cancer that are experienced have this very steep rise in function with time. In fact, if you look at it, just now it shows that it rises at about time to the 5th power from age zero for most of the cancers for lung and bladder and this age zero was predicated on the assumption that that's when people start becoming exposed to many of these agents. In the case of lung cancer the dominant feature in its ideology is cigarette smoking and that typically does not involve exposure prior to age 15. At that point if one shifts the curve to account for 15 year period where an individual was not cigarette smoking, you find the curve also follows the same power law. From this, one can say that if you have a risk for example at 10 years, it might be very low, but because time factor which goes up as steep as the 5th power, what that means is that at 20 years, 10 years later, 2 times longer, the risk would be increasing that twice, but twice taken 5 times, so it will be increased 30 times from the exposure that began 20 years previously. If you then consider what the risk would be at 40 years, it would be another 30 times, it would be 1000 times greater than the risk that would be manifest 10 years from the exposure. So you have this ever increasing risk with exposure to the agent and thus we have a long period from exposure to onset of disease. If one identifies an exposure circumstance, to wait until when one sees the disease could be a catastrophe because there would then be a backlog of disease that would be forthcoming for decades thereafter. In a 40 year period, to wait until we know something for sure, in terms of carcinogenesis from a given exposure circumstance, is totally unacceptable. In a situation where we can often never know what the carcinogenic risk will be in a population exposed, because of this limitation and thus one must act with the information we know, otherwise on the time course of cancer, and otherwise on the carcinogenicity of agents from animal data or from other human exposures. In some cases it's found that combinations of exposures have a very significant effect. If you are exposed, for example, to asbestos and to cigarette smoking, the two combined in a multiplicative way, we'll talk about that in a moment, but the added exposure of an external agent often will make the risk that would be there otherwise much much greater and combinations of effects in some circumstances can be particularly deleterious and this combination of effects,

where one agent has some action on the production of cancer and another agent has another action in that production of that same cancer, implies that cancer is a multi stage process where many different exposures, each, can have an effect in the production of cancer. This has led to concepts such as some carcinogens are initiators and some are promotors. Initiators can be particularly disastrous because if cells are initiated at a very young age, the long life span ahead of a child will mean that there are cells available for some promotors to act at a later time and complete the carcinogenic process. On the other hand promotors, if applied at any time, when there is already an underlying high risk can be particularly deleterious but it would have another time course. In the case of asbestos one actually finds both features. Here one sees the effect of the promotional action of asbestos on cigarette smoking. It is multiplying the underlying risk. The underlying risk is that curve that is rising very very rapidly from something nearly at the lower axis to a relative rate 60 times greater over a 30 year period of time. But no matter what that underlying rate is, the asbestos is multiplying it, and so, when it is multiplying something that is extremely high in old age, the effect is very dramatic. And it can be seen in this particular slide. In individuals that were unexposed either to asbestos or to cigarette smoke, in a study of the American Cancer Society, the risk of death from lung cancer was 11. If one smokes, in the third line of that graph, but was not exposed to asbestos, the risk of death from lung cancer was about 123. It was 10.8 times greater than the non smokers. This is the average added risk over a long period of time of smoking around a pack and half, two packs a day, the average number of cigarettes smoked by cigarettes smokers. If you look now, those individuals who were asbestos workers but did not smoke cigarettes, their increase risk was about 5 times that of the non smoking, non asbestos workers. But the dramatic effect occurred in those asbestos workers who did smoke cigarettes. Instead of having the cigarette smoking affect and the asbestos afffect additives, so that there would be a 15 times increase risk, they were multiplicative and they were increased by 53 times. Now this can happen too in other circumstances. If one looks at vinyl chloride, one finds that in individuals, this is not human data. One finds that in animals exposed to vinyl chloride alone, there are 18 liver cancers in the group of

animals observed over their lifetime. If they in turn were fed alcohol that number doubled, whereas alcohol alone did not have an effect at all, so that a combination of, in this case vinyl chloride and alcohol, where alcohol would apparently be acting as a promoting agent, has led to a much increased risk of cancer. Then when one turns to this consideration of synergism, which is an important factor when you have an exposure to a multiplicity of agents such as in a hazardous waste site, the multiplicative factor for individual agents in that dump site is probably a fairly unimportant one because in most circumstances the carcinogenic risk would be a very small one. The added risk in a population might be one in a thousand, one in 10 thousand, goodness sakes it would be worse than that, it would be total catastrophe. But say its one in a thousand. If you have one agent that increases the risk by .1% and another agent that increases the risk by .1%, the multiplication of those two risks 1.001 times 1.001 is really the same as an additive risk. You get a total risk of 1.002. The combined effect, which is multiplied only in the fourth place is a very small one, so multiplying two numbers each slightly greater than one is the same as adding those two numbers. But the carcinogenic effects that are of importance, between agents and the dump sites, are not between one agent there and another agent there, but between an agent that is carcinogenic in that dump site and other agents that we may be exposed to otherwise. Cigarette smoke, drugs that people need, may be required to take for various health reasons. These can interact with carcinogens, alcohol and other exposure circumstances in which the exposure to the person is continuing to enlarge. There your multiplying could be a large effect by a small effect and the multiplicative factor would be a very important one. So synergism must be considered but it need not be considered between individual pollutants in a particular dump site. In the case with asbestos and with cigarette smoking, each was multiplying the underlying by ten times so when you multiply 10 times 50, 10 times 5, you indeed got a very large number, but multiplying 1.01 by 1.01 gives you an answer that is 1.02. The, let's skip that one. The other important issue with carcinogens and one that has been looked at by a wide variety of people is what is the dose response relationship, that is, what is now the risk over a lifetime of an individual's exposure to so much of a given agent compared to a much greater

or lesser amount. Recognizing that one must in such an analysis take account of the time course of cancer and observe the populations over a sufficiently long period of time, over a lifetime hopefully, in order to not be, not obtain a misleading result. In general, most of the extrapolation schemes have suggested that risk of cancer drops more rapidly with lower exposure than the proportionality would be of the reducting in exposure. In other words, if you reduce the risk of an exposure by 10 times, many of the extrapolation schemes would suggest that the risk is reduced more than 10 times. At the very low levels it could be 100 times or it could be 1000 times. These models are called low loggit models, progget models - a variety of names. An approach called the Mantel Brian approach is one that has a very steeply dropping risk function as exposures decrease. I would submit there are no data that would verify any of these very steeply dropping risk functions. The data that we have suggested over certain ranges, the best that we can do, and there are even limitations there, that I will mention in a moment, is that a linear dose response relationship should be considered as the, in fact as the least conservative, a more conservative approach would even have a slower function but for many carcinogens it appears that linearity would suffice in extrapolation to lower doses. As you reduce the risk ten fold, you reduce the risk ten fold, 100 fold, the risk is reduced 100 fold but in some cases that may not be sufficienty conservative. This slide shows dose response data for vinyl chloride exposure in animals. There's two curves there, there is a top curve that goes up and it's curving, you can see three points on it and it goes down to zero. That curve corresponds to the lower axis on the bottom of the slide where exposures to the animals ranged from zero up to 30 thousands parts per million. I had to draw out on two slides because in this experiment, there were a very large number of exposures that were taking place between 10 and 5 hundred parts per million and they didn't fit on this slide when the axis was 10 thousand, 20 thousand, 30 thousand and so there is another axis that goes 2 hundred , 4 hundred, 6 hundred and that applies to the data on the little open circles with the dot in the middle. And it shows that in that range from zero to 5 hundred there is a fair linearity between dose and response and that line. The right most line, is translated by dividing it by 50, the difference between the ratios of the 10 thousand and

the 2 hundred to a straight line going very steeply up to 10 parts, I'm sorry, to a mortality of 10%, after which it then curves over and the full curve line is that which is the full dose response relationship for the animals. Now the problem is if one does animal studies you tend to want to do animal studies where you're looking at 10 to 20% of the animals with tumors. You don't have a statistically significant experiment that shows that indeed this agent is producing cancer, so you would be way up there on the curve portion of the line and then if one extrapolated to the origin to assess a risk at lower exposures with the scant data that is available for animal exposures in general. Vinyl chloride is a unique exception. One would have a dose response relationship that would be about 5 times less steep than the actual one that was measured in this case. The reason for this curved line is that the animals and metabolizing vinyl chloride, first metabolize at lower concentrations to a molecule that is reactive and involved in the carcinogenic process. That metabolic state gets saturated and vinyl chloride then does not get transferred into the active molecule but remains in the body for a short period of time and it's then secreted unchanged. That which is secreted unchanged is not doing an effect and that's what leads to that kind of saturation. When that occurs, then indeed one can be misled, even using a linear dose response relationship, so conservatism in looking at animal data, conservatism in looking at information in high exposures is absolutely necessary when considering risks at low exposure. Actually when one takes that into account, one indeed finds that there is a fairly linear dose response relationship according to the amount of the activated vinyl chloride in the body so that with complete formal kinetic data one can make some appropriate risk estimates and make them much more accurately then would be available otherwise. But such information is generally not available and one either must obtain it or one must act conservatively in its absence. The second issue that I would like to, just briefly talk about, is that which also relates to genotoxic damage, birth defects and miscarriages. There's been many reports of miscarriages with exposure to various toxic agents. Styrene workers have been a noteable group. In the Love Canal circumstance there were 17 miscarriages noted in the population that lived near, or adjacent to Love Canal whereas only 10 were expected. This may be a very early and very

important manifestation of exposure to the many toxic agents involved in dump sites. And thus it is an appropriate thing to look for insights where there is concern. The difficulty with such analysis is that comparison populations, the comparisons that one would make with general population data, lead to fairly large uncertainties. One is never sure that you are really looking at a comparison population that would equal otherwise in all other respects in terms of occupational exposures, in terms of other personal habits such that you do have a valid statistically reliable difference. The statistics certainly might be there but the biases might also be there that could go either way. One might estimate on the lower side, one might estimate on the upper side of risk depending upon whether there are unseen biases in the comparisons one makes with the birth defects in an unexposed group and a potentially exposed group with another population. I would make one comment on heritable birth defects and that a fairly favourable one. At this point, in terms of transmitting mutations from an exposed parent, prior to conception, to a child, the data are such that there is no substantial data that would indicate that is a significant factor even in circumstances when exposures to potentially mutagenic agents have been enormous. They haven't for example, found transmittable heritable mutations in the population exposed at Heroshima, that is children from those exposed have not been shown to have birth defects from the exposures to their parents. Even though the exposure, the parents exposure was great, cancer in a very large population of several thousand is increased 10%, chromosome breakage in that population to the higher exposed a proportion of that population had 30% of the lymphocytes with abnormalities. What happens is the miscarriages. Generally there is an abortion prior to, a spontaneous abortion, prior to termination of pregnancy so the, in this sense well, there is certainly genetic damage. It fortunately does not lead to general significant number of transmittable heritable defects. There probably, certainly is some there, but we don't know of any. The studies have so far been inadequate to detect them. Thus it would be apparently of a risk less than that of cancer under these circumstances. Another issue of concern is that of immunological defects. The data are now only beginning to come to light about where such defects may be manifest. We have undertaken some studies at Mount Sinai School of Medicine of different

populations looking at the immunological status of them. These populations include individuals exposed to PCB's and indeed have found in such individuals severe deficit of lymphocyte function and numbers of lymphocytes in the body's immune system. We found similar, we found different abnormalities in individuals exposed to PCB and it's also known that they occured in individuals exposed to dioxin. These exposures have generally been fairly high. One usual feature that I would just like to mention, to indicate that they may also obtain at lower exposure circumstances is just some data on the immune status not of lymphocytes but of recall antigens available in the body of asbetos workers as compared to the general population. In general one finds in the control population that there is a response by the body system to mumps, tuberculin, some bacteria, some viruses but in asbestos workers the response for most of them, with the exception of tuberculin, is abnormally low and in fact, over the entire group, the number with no response to any of the antigens is about 30%, although the PPD tuberculin antigen is unusually high and indicating a different type of abnormality. The finding in asbestos workers itself was an unusual feature but the finding now of the same deficits of immunological status in simply the women, who were simply exposed by virtue of the dust brought home by the workers, indicates that at much lower levels of exposure to some toxic agent, one can also have manifestations of some immunological loss. The significance of this is not known at this time. We don't know whether such deficits, in any of the groups that I have mentioned, have later consequences, whether they lead to a greater risk of cancer or not. We actually have a study underway to try to assess that and looking at mortality in asbestos workers where there will be a very high mortality from the past exposure to the fibre, to see if their immune status has a bearing upon their later risk of cancer. But at this time, one can only indicate the possible concern from this particular feature. Finally, I would just mention neurological damage. Tests are now being developed for performance tests that are not education specific, that can be done by people of a variety of educational backgrounds, that indicate whether ones performance in doing block manipulation, recognizing figures, a wide variety of tasks now are available and they do indicate that, certainly with exposures to metals, exposures to solvents, in particular some other toxic agents also may show permanent damage

in this area. And it is a test that should be applied more, in order to assess effects at lower exposures. These effects that I've mentioned have been in populations that were healthy populations, they were workers, they were people that were not otherwise impaired. When one looks at the general population one finds that there are individual groups that are particularly sensitive in that population and special concern must be taken for these when you're making comparisons of working groups, when you're making comparison from animals who have been selected very carefully. It must be considered that there are people that are, will be more sensitive in the groups that may be exposed to hazardous wastes. Embryos and fetuses are particularly at risk. As I mentioned previously, young children. Young children for cancer, as I indicated because of the long time subsequent to exposure that the altered cell is susceptible to promotion by other carcinogenic agents, lung disease in people already with asthma or emphysema, coronary heart disease for chlorinated solvent exposures may be a risk factor. Liver disease certainly is a factor in exposure to other chemicals. If you look at the number of people that may have these conditions in the general population, it turns out that about 20% of the general population is susceptible to something and consideration must be given to data in assessing risk from exposures. In summary, in terms of considering the information that we have, in assessing risk from toxic and hazardous wastes, the information is very limited. What we know is some of the parameters that must be considered, but if you try to make very explicit risk estimates of exposures to known concentrations about a hazardous dump site, those risk estimates are going to be very uncertain. With the agents that we do have information, asbestos for example, there has been hundreds, literally hundreds, of studies done in the carcinogenicity of asbestos and maybe a dozen of them have some validity to them. The best we can do, in making a risk estimate, at very low exposures such as might be present in schools with asbestos sprayed on the surfacing material or from asbestos blowing from a dump, is to make a risk estimate based upon a measurement of the exposure there, that would be a value that could be uncertain by 30 times upwards or 30 times downwards. In other words we could only put a range of a thousand fold on the risk of one of the most studied agents that we have. If you consider vinyl chloride, in fact right now in

vinyl chloride, there also has been 12 human studies of different populations exposed. We have one of the most studied of agents in animal studies. The best that we could do, even extrapolating from the exposures of the past which are an uncertainty, we don't know very well what these exposures were, to the risk that current occupational exposures is of 10 fold factor. We are even uncertain what the estimates are still in the workplace. Now to go down another factor of 1 thousand from the part per million that we measure in the workplace to the parts per billion that one measures in the environment involves much more uncertainties, then again, we have a very great range of uncertainty. The fact is, that when one considers the health effect of hazardous waste sites, one is always going to be faced with these uncertainties. We know that they exist, we know the information on what may be carcinogenic, we know how some of those agents work, but we will not be able to tell exactly what the effects will be. The basic precaution then must be, if we are going to assess health effects, and act upon them to evaluate the risk from this dump in order to see if there should be procedures undertaken to control it, we must act with prudence and resolve any doubts in favour of public health. To do otherwise, I think, would be wrong because the likelihood is that the doubts, if resolved by experimental data, in the past have always shown that the health effects typically are greater, because we are always looking at things that take a long period of time and most observations are too short, so that in general, the range of uncertainty is such that the likelihood is that the higher risk is the one that is going to be manifest and so, in any risk extrapolations one must err on the side of conservatism. Public policy would demand prudence be undertaken . And this follows with what Sam was saying that the burden of proof should not be on the victim, the burden of proof should be otherwise. If there is need for further data in order to renow that range, let the data be collected and analyzed and studies done by independent research organizations but until that data exists, that would indicate that something is safe, then it must be considered hazardous within the limits that we know at this time. I would like to just briefly conclude by showing some of these problems as they have existed in a couple of situations where in fact that policy was adopted. This is the slide, the Reserve Mining Company in Silver Bay of Minnesota process tachylite

from the Masabi Range into pellets for shipment down to Minneapolis to Lake Erie and their waste went into Lake Superior, they were sleuced down that waterway. One hundred thousand tons of waste was dumped into Lake Superior and one can see in the lower right hand portion of this slide a white spot in the western arm of Lake Superior covering one hundred square miles which is contamination from that effluent at Silver Bay. Thirty per cent of the effluent contained material that was similar to an asbestos variety and when it was carried down to Duluth the water that people in Duluth drank was found to be contaminated with asbestos like fibres. There were long fibres, short fibres, large fibres, small fibres. The concentration in the drinking water ranged from, in this case, from 20 to 75 million fibres per litre of water. In days when the Lake was stirred up, the people were drinking 1 billion fibres of asbestos like material in every litre of water. One could even risk estimate of that and they turned out to be a fairly substantial at 1 hundred million fibres per litre. The lifetime risk of cancer would be estimated, it would be something around a thousand perhaps more, perhaps a bit less. But even with that lifetime risk, it would be impossible to see any effects in the population exposed and thus it was necessary for action to be taken on the public health concern, separate from the finding of bodies in the streets. It was impossible to even find them and the time over which they would be manifest would be years to come. The resolution of the case, the court action led to the requirement that Reserve cease that form of pollution, to go to a on land disposal site and public health was served in that way. This is just a slide to illustrate some of the problems with toxic waste dumps. This is a plant, on the right side of that film, that made agent orange for Vietnam, it's in Jacksonville, Arkansas. The picture is taken just outside the plant site. There is a sign of a house for sale right nearby. They were at that point trying to dispose of all the contaminated wastes, the dioxin contaminated waste and drums that were buried on the site. Some were digging for those drums as shown in the background but it was also found that the dioxin had also gone down the stream into a holding pool for the community sewage system and then from that downstream elsewhere and finally to the Mississippi River. They were finding contaminated shell fish as much as 15 miles downstream. This is a typical story and I'm showing it for what it is.

It's been happening everywhere else but when I was driving around trying to look at those different sites where the dioxin had been identified, the road going to that public sewage holding pond went by Eddy's Electric Supply house where there were 1 thousand transformers in which most of them had fluid in it that had been leaking. The entire area there was contaminated with PCB's to parts per thousand not parts per million so the casualness of use past wastes will be haunting people to come in this community, which was concerned with the dioxin, actually had sites like of which they were totally unaware. So the need clearly is for vigilance in searching out the unknown sources of hazardous wastes that still exist. We have identified these 30 thousand, there probably could be as many that are unknown at that time. Let me skip this one. This is a site of mercury contamination in the Meadow Lands where they were finding dump sites containing as much as 2 hundred tons of mercury in the top 2 feet of a 32 acre area. The mercury was leaching into the stream, to the Hackensack River and down to Newark Bay leading to somewhat elevated levels of mercury but not catastrophically as high as had been found elsewhere. The one benefit of the Meadow Lands is that it is so contaminated with other materials that the bacteria that converts mercury to methyl mercury such that would enter the shell fish could not live in that area. If they would clean it up before getting the mercury out they would really have the problem of the mercury, but they are faced with potential human health hazards from the ingestion of the fish and it would be much exacerbated if they rolled back bateria that converts mercury to an organic form were viable. Kids play in the dump and this inhalation of vapors is hazardous to wildlife. There is a cost of cleaning it up. It certainly, the cost is high, its millions of dollars but the real estate thats tied up with that contamination is worth 2 hundred fifty thousand dollars per acre. The mercury $350 per flask. The amount of mercury that's in there is enough to be mined if it were found elsewhere in the world but clearly it is not the case but the moral is that in many circumstances one can actually make clean up economical and viable and its the same issue that Sam mentioned. Finally, I would just like to show again some of the problems of knowledge, do we really know what is there? Are we really taking appropriate action? This is a steam tunnel in a building that was going to have a pipe removed around which was asbestos material.

They took the asbestos material off, there's still a piece left lying there. It was put in a open cart and taken through the hallways and you could find the tunnel by which it came by the white material there. It was dumped then into an open bin outside the building. From that open bin it was dumped into an open truck to be driven through the streets of New York, that's Central Park in the background. If you go to place where all this transferring was taking place, first into the open bin and then back into the truck you will see it was located appropriately underneath the air intake of the building. Going back where that contaminated floor lay was and looking at the first doorway when one comes to it, it says Inhalation Therapy Department, Mount Sinai Hospital. This was about 10 years ago where there was certainly enough knowledge, certainly enough awareness at that institution about the hazards of asbestos, but the lack of transfer of information was taking place. They needed to have a pipe taken out in the basement so they hired a contractor, the engineering department may or may not have taken precautions themselves, they weren't in the specifications that one dispose of material properly, even though knowledge at that time existed. This sequence of transfers of responsibility takes place in many of the industrial activities today, particularly in waste handling, particularly in demolition, particularly in removal of materials and in that transfer, there often can be a loss of control and that is probably the greatest area where concern must be exercised. How do we maintain responsibility through a multi series of control in different groups, different corporate entities involved? Thank you.

Bill Kennedy:

For everybody here Dr. Nicholson, thank you very much for your most informative presentation. We will take a few short questions from the audience, to Dr. Nicholson if there are people who have questions. Mr. Emberley...

Mr. Emberley:

Dr Nicholson, Ken Emberley from Winnipeg. Thank you for your wonderful address. May I ask Sir, would any of your address, your printed address or copies of your slides be available? Is that possible?

Dr. Nicholson:

I could send you material that would contain much of what I have just talked about.

Mr. Emberley:

If you would consider sending that to our Convenor of the Conference to the people we would be extremely grateful. They could make it available to those that wish and of course that would hold true for Dr. Epstein's and the other addresses. We would be so grateful to get copies of any of that information. Thank you very much.

A Lady:

Mr. Chairman, last night on the CBC there was an hour long documentary, about half of it devoted to asbestos workers in Ontario and there was a great difference in policy there from the British Columbia government which seems to agree with you two speakers this morning, that the person who has been affected by the asbestos fibers shouldn't be the one to have to prove it. They have cases in Ontario of, this was John Mansville I think, where the Company has, seems to have control of the medical people, they ignore the personal physicians findings. Have you any suggestions how your information can be gotten to the right places?

Dr. Nicholson:

I can only reemphasize what Dr. Epstein said. It is absolutely imperative that people first know what is involved in the community but more importantly to know what is happening to them. And medical records of any individual are his or her property. They are records of themselves. They should not be kept by anybody else, unavailable to that person. Now if there are circumstances where that in fact obtains I think the only thing that one can do is a medical facility available to, in this case, it sounds like a very large group of workers, that is independent and can evaluate their status and provide to the individual the accurate information of their health status.

Lady:

The Company policy specifically said that they could not see the medical record, it might upset them.

Dr. Nicholson:

I'm sure it would. I just might mention that reflecting back to what I was saying that when we, about the need for, with the uncertainty that we have now in health effects, to adopt the policy that would be based upon the highest level of hazard that one might predict. In the case of asbestos, as little as 15 years ago, the concensus was that the major problem was simply in the workers, those that made the materials in the factories and then shortly thereafter those that applied it as insulation workers. But in actual fact, the major problem is not in that group. The major problem because of the number of people exposed, is in those who happen to be working nearby when it was done. And now we're finding serious problems in people who simply live in the homes of the workers. I showed you some immunological data, but 30% of the wives of workers that we've measured have x-ray evidence of lung scarring and individuals living in households or living around factories, have shown to develop asbestos cancer. It's likely that the number of these environmental cancers, as studies are done, will increase in number. There are even cases now in the courts where children, people who have been exposed to asbestos as children in schools have developed mesothelioma and are suing the companies as many others are also. Unfortunately as more data becomes available usually more evidence of effects becomes available.

Mr. Emberley:

Sir you mentioned medical records being a person's private property. Would you comment?

Dr. Nicholson:

You should have access to it even you may want to have them kept in a medical facility but the information. He should get that information.

Mr. Emberley:

The information should be available to the individual.

Dr. Nicholson:

Absolutely! All the information should be available to the individual.

Mr. Emberley:

When our Canadian Transport Commission investigated a major vinyl chloride railroad spill outside of Winnipeg, the Chairman of the hearing, according to reports, stated that he wasn't a medical doctor so he wouldn't ask any questions about the medical aspects of the case. To help him, the railroad submitted all the workers medical records on, late in the afternoon, on the last day of the hearings and said "These records are all the employees private confidential information so we are classing them as confidential and there are submitted to you". There was never a word mentioned in the whole hearing about the workers health or safety or their cumulative involvement. Do you think that was a mistake to omit that?

Dr. Nicholson:

I think that was a misuse of confidentiality, from what I understand was done, just as I would say a worker has complete access to his medical information, he also has the right to have that information protected such that it would never be released as his individual result to anyone else without his permission. But if he has undergone examinations as part of a screening program and an assessment of a health effect of a group of people, the statistical results of that group should be released and a public release can be made without the individual requiring his signature on the release. If his or her result is not going to be individually identified. So the important thing for public health assessment is statistical results. The important thing for person health action is personal results. And the two are quite different, they are quite separated.

The Floor:

Dr. Nicholson, just to change the topic, I was wondering if you are familiar with any work into the cancer properties of ethelyne dibromide which is not really a waste, it's added to all our leaded gasoline here.

Dr. Nicholson:

I'm not sure on that particular agent. I just, you know, I practically can't keep up with all the ongoing results of any particular toxic agent unless it happens to come within some reseach activity that I'm doing and that one, I'm sorry I just don't know the answer.

The Floor:

Winnipeg is known to have a high cancer rate in Canada as well as a high heart disease rate and a high stroke rate. We're also one of the areas with the most spray programs for pesticides and herbicides, and yet despite all the hearings we've had to date, there's always no evidence of any adverse effects. I would like to know what you would recommend as to what type of health study should be done because that is one of the recommendations which has come out recently from the Clean Environment Commission report, under the jurisdiction of our new Minister, Mr. Jay Cowan. I would like to know what kind of recommendations you would make, to the citizens of Manitoba, on what type of health studies we should have and what citizen's participation there should be on these studies and accessibility to medical records. We are denied access to our medical records in Manitoba. There is also a double reporting system on these records.

Dr. Nicholson:

The issue of a health study is one that is so complicated in terms of what the exposures have been, what the circumstances are, what the populations are, that I could not answer it directly without a great deal more information. Health studies are possible. They should be focused on what the agents are of concern. Some of the more important features of such health studies would involve probably not manifestation of overall effects because those are often very illusive and very difficult to assess in terms of

comparisons of populations, but often on some of the more subtle things, the body burdens, possible alterations and certain enzymes are quality parameters to such exposure but to make a recommendation and even discuss the issue would require complete knowledge of what the circumstances are. I might just mention that such studies can be effective. We have just completed one, actually under the auspices of the government of Canada on Mohawk Indians that lived in the St. Lawrence, on the St. Regis Reserve in the St. Lawrence River adjacent to a United States aluminum smelter that was pouring fluorides onto their property, and finding that the cattle were severely affected and also we were looking at mercury levels because there's a Canadian plant dumping mercury in the St. Lawrence. One can document exposures to all of these agents in the Indians. It was possible to document some possible neurological effects to those that were heavy fish eaters from the mercury and some marginal non, well some possible effects from fluoride that were not that serious.

The Floor:

I read of that study that was being done but I haven't seen the results of the study. One of the things in that is one child who had died, the doctor told the parents that his internal organs were smashed and he was in a spray area and he was well sprayed. The trees are sprayed in this city, the grass is sprayed, the insects are sprayed, the farmers sprayed and we pray at the time. And yet when the parents ask for toxilogical assessment of the tissues, specimens were taken, they were denied this information. They were told by the doctor it was not needed despite the history of medical exposure. Also this is not happening just in this child's death. We have gone around and asked other questions and we asked about the ailments, whether they took place before known chemical exposure or after and I have been able to get the answer that most of the times that the ailments followed the exposures and yet our Health Department is not going around and asking these questions. So of course, you know it's going to be very vague any answers we get in this province.

Mr. Kennedy:

Thank you for your comments Ma'am. If there are no further questions I would like to once again thank Dr. William Nicholson for his very enlightening remarks and I think to formally say good-bye to he and Dr. Epstein, who I understand are leaving shortly. We very much appreciated both your presentations and look forward to reading you book Dr. Epstein and Dr. Nicholson to receiving some documentation from your particular speech. Thank you both. I would like to now call upon Dr. George Bowen, the Assistant Deputy Minister of the Environmental Management Branch to give a presentation on the hazardous waste problem in Manitoba and an outline of the future program proposed by the Government. Dr. Bowen is the Head of Environmental Control, Environmental Monitoring as well as Environmental Assessment in the Province. Dr. Bowen...

Dr. Bowen:

I would like to thank you, Mr. Chairman, for inviting me to speak at the Symposium. The topic I want to discuss today is the problem of hazardous and special wastes and how our Government is attempting to address this most serious and important concern. It's unfortunate, I suppose, that most people don't realize that we are all generators of hazardous waste and therefore it is incumbent upon all of us to be part of the solution. I'm sure that if you spoke to many people on the street they would say that hazardous wastes are produced by industry and our exotic chemicals with using the scramble alphabet in their name. This is not necessarily the case. Hazardous wastes represent everything from used automobile oil and cleaning solvents to such things as residues from lawn herbicides and pesticides. Some other examples of hazardous wastes of an industrial type in our society are pathological wastes from hospitals and research laboratories, sludge containing heavy metals from manufacturing industries, waste oils and solvents from garages, printing and transportation companies, acids and alkalies from petroleum and chemical industries and pesticide residues in used containers, chemicals and also chemicals that are now banned, such as PCB. There are more than 60 thousand chemical substances used in North America and new compounds are being continually developed. Some have gained a sinister reputation because of the

potential danger they pose to human health and to the environment. Waste may be considered hazardous for a variety of reasons. They may be highly flammable, explosive, corrosive, highly reactive, toxic or infectious. Others may cause cancer or genetic changes or they may concentrate in living tissue to levels harmful to organisms. Many wastes fall into more than one category. For example some hydrocarbons are both highly flammable and toxic. I would like to comment, at this time, on the term hazardous. A waste can be defined as any substance which the owner or generator has no further use for and which he discards. Hazardous wastes are further defined as those wastes which, due to their nature and quantity, are potentially hazardous to human health and the environment and which require special disposal techniques to eliminate the hazards. I think that this latter definition, under the right circumstances, could apply to the large amounts of waste paper we generate each day. If you consider the terms nature, quantity, potential, special. Paper is by nature highly flammable, in large quantities it has the potential to fuel a large and dangerous fire, special disposal and handling techniques are required for paper to ensure it does not catch fire or that it does not cause a serious fire if it is allowed to spread. Now it may be overly simple, may seem overly simple to compare common waste products such as paper, discarded plastic bags or empty glass bottles or oily rags, to highly toxic chemical waste, but is it really? The point I'm wanting to make is this. Because we understand the nature of the potential problems these substances pose, because we recognize the danger posed by such common wastes as paper, we deal with them calmly and logically, almost as a routine. I suggest that it is very important in the case of chemicals and hazardous wastes, that we come to a point where we can do the same, deal with them calmly, logically and without hysterics. In the 60's and 70's, our Environmental Division placed emphasis on the control of the traditional potential pollutants such as sulphur dioxide and lead in the ambient air and municipal solid wastes, but today we are challenged by new environmental problems, for example acid rain resulting from long range transport of air pollutants and toxic contaminants in waterways and land fills. We must meet the needs of a public that is now more and better informed and have higher expectations about the quality of the environment in which they would like to live. One of the problems of

environmental jurisdictions, at least the problems they are facing, in dealing with this, the newly recognized pollutants, is the evaluation of risk. Since it seems impossible to remove some of them completely without curtailing the quality of life we've all come to enjoy and expect, in dealing with any of these substances, the risk to the population and the environment must be assessed. The difficulty there, lies in the fact that there is no concensus among the public as to what an acceptable risk is. The public perception of risk is highly subjective. If the risk is taken voluntarily, as for example, in driving a car or smoking a cigarette, the level of acceptance is very high. On the other hand, concerns over the effects of certain contaminants on health are sometimes exaggerated. Risk can be estimated scientifically but the acceptance of a particular level of risk must be resolved on a wider basis and this is an important role for public participation, public education. In talking about hazardous wastes, may I draw your attention to the concept of hazard, which is a function of both toxicity and degree of exposure. In the context of this symposium, toxicity is a property of a hazardous polluting substance which produces adverse effects in living organisms when they ingest it, inhale it, contact it or are injected with it in sufficient concentrations. Toxicity is then primarily a biological concept. As yet, there is no instrument that can measure toxicity. It can only be determined by the response of an organism. The toxicity of a substance, therefore, is not a discreet property but a relative one. Level of toxicity, therefore, has meaning only when one substance is compared to another. All elements, chemicals and mixtures, produce toxicity at some exposure over a certain amount of time. To compare toxicities one must fix either the amount of the toxicant or the period of exposure. For example, both table salt and arsenic are toxic, however, salt is considered less toxic than arsenic because more is needed over a longer period of time to produce toxic effects. For most substances there is a threshold dose or exposure level below which no adverse effects occur and some on the other hand, there is a comparatively small number but nevertheless significant number, of chemicals that are believed for all practical purposes to have virtually no safe threshold, for example chloro methyl ether or beta napthalimine. Accordingly, ideal criteria would reflect the relative hazard that a waste poses on society and the environment. In

Manitoba we are extremely fortunate because we do not have an acute problem with hazardous wastes, however, we can't afford to be complacent about it and that is why we are putting into place, now, our hazardous and special waste management program. It is estimated that Manitoba produces roughly 45 thousand metric tons annually of hazardous waste and while this is not a large quantity, in comparison with other jurisdictions, it is still a significant amount that must be treated and be disposed of in an environmentally acceptable manner. Here in Manitoba we want to avoid the horrendous problems currently being experienced in other areas particularly in the United States. We heard about some of these cases this morning. I'm sure that most of you in this room have heard the news report that the Federal Environmental Protection Agency has on record over 8 thousand hazardous waste disposal sites in the United States and a total of 114 sites are on their number 1 priority list. It is currently estimated that it would cost between 3.6 and 25.5 million dollars per site to apply the appropriate remedial measures necessary to ensure environmental integrity in each of these sites. The entire national bill for a clean up program could total roughly 40 billion dollars. The costs are staggering and we can see why now, why many Americans are referring to hazardous wastes situation as the most important and pressing environmental concern of the century. Learning from the past, I would like to mention a little bit more about Love Canal and others. Love Canal is one of the most tragic examples of inadequate disposal of hazardous wastes. The problem originated in the 1920's when a partially constructed canal in Niagara Falls, New York was converted into a muncipal and industrial chemical dump. In 1953 a prominent chemical company, which then owned the site, sealed it and sold it to the city and later several hundred houses and an elementary school were built next to the site. In late 1970 after prolonged heavy rains, chemicals from the abandoned dump began percolating through the soil into yards and basements of the homes and the school. Trees and plants turned black and died. Toxic chemicals collected in puddles, children got chemical burns on their hands and faces. Some 82 different compounds were identified. Some suspected as carcinogenic. The ensuing relocation of several hundred families, and the lawsuits and claims that are beginning to add up to billions of dollars in compensatory and punitive penalties. Other such costly lessons

include deliberate mixing of toxic wastes including nitrobenzyne and cyanide with other substances for use in road paving in several East Texas Counties. Later there developed adverse effects on the health of local residents and livestock. In New Jersey in California other cases of mismanaged disposal of hazardous wastes have resulted in widespread contamination of drinking water with extraordinarily high costs of clean up. Now, since World War II, North America has had a dramatic increase in population and industrial production. As a result, hazardous wastes from manufacturing processes have multiplied far more rapidly than our understanding of their potential danger or more rapidly than the development of facilities for their disposal. And I ask you to bear in mind, that all of us have come to value many of the products whose manufacture contributes to hazardous wastes. In 1979 Environmental Protection Agencies stated that most hazardous wastes were being handled improperly in terms of protecting human health and the environment. Past practices for industrial wastes disposal were primarily land burial, ponds, unlined lagoons and river dumping. Liquid wastes leached into ground and surface water resulting in contamination of this precious resource. EPA estimated that in 1980 at least 57 million tons of hazardous wastes were produced in the United States. They add that there is grave danger of improperly handled hazardous wastes polluting underground aquafers. For one half of U.S. current water supply comes from these sources and once polluted, they cannot be cleansed easily, if at all. Slowly, I'm glad to say, this cloudy picture and this gloomy picture is changing. Industry is beginning to realize the extent of the problem and is taking initiative such as changing to industrial processes which generate less hazardous wastes or developing new products without toxic wastes, or selling or trading the wastes to other industries as a raw material for the other industry. I understand that in Europe, trades of as much as 30% of the listed hazardous wastes are occurring. Perhaps we'll hear more about that later. Many wastes can be reused in the industrial process by the generator or by another manufacturer. It is this terrible scenario of neglect and negligence that we want to avoid in Manitoba. While we have been fortunate in this Province in not experiencing any serious difficulties with hazardous wastes, I'm sure most of you will agree, are aware of the fact that there are tons of materials going into municipal landfills and into municipal

sewers across the length and breadth of the Province. Coming back to California for a moment, it is interesting to note that following a report on alternatives to land disposal of hazardous wastes, the Governor of California, signed an executive order establishing a new state policy on hazardous waste management and directed the Department of Health Services to develop prohibition of land disposal of highly toxic wastes to encourage the construction of new, advanced treatment facilities, increase monitoring and enforcement inspections at all hazardous wastes disposals sites, actively involve the citizens of the State in the hazardous wastes management program and to require industry to develop programs to reduce the amount and toxicity of wastes now disposed of in land. Thus the Governor's 1981 and 1982 waste management program represents a radical shift in favor of an aggresive program to direct the most hazardous wastes to recycling physical chemical treatment and distruction facilities. Examples are PCB, pesticides, cyanides, toxic metals, heloganated organic chemicals and volatile organic chemicals. I should tell you that our Department is currently working with Environment Canada on a joint study, assessing all existing and abandoned landfills in this Province. I have to say that the task is much larger than we had initially envisaged and is taking a little longer than we had anticipated. The first phase of the study in now complete and it has identified the existence of 760 waste disposal sites in the Province of which 530 are active and 230 are inactive. Of the 760 sites, the study recommends that 194 sites be investigated further with approximately 20 sites to undergo in depth investigation. While the study, which was carried out by the Consulting Firm of Interdisciplinary Systems of Winnipeg, did not reveal any Love Canal situations in Manitoba, it did raise some concerns about some industrial and municipal landfill sites which are located near wells and surface water drinking supplies. The study also identified some of the older, abandoned landfills which are now experiencing problems with the seepage of methane gas, for example Brandon. There is a problem there with the seepage of methane into a number of premises situated in the east end of the City. At the present time both the Environmental Management and Workplace Safety and Health Divisions of the Department are working to assist the City in trying to resolve the problem. Similar methane gas problems have been experienced in

other areas of Manitoba, in particular the City of Winnipeg. Several years ago the City of Winnipeg had to embark upon a multi-million dollar remedial action program to resolve a methane gas seepage problem in the St. Boniface area. These methane gas problems, however, are small in comparison to the difficulties we could have if we allow disposal of hazardous waste to go uncontrolled. That is why we are proceeding with the program before we have crisis and before we have serious problems. I'm proud to say that we are one of the first jurisdictions in North America to be embarking upon a relatively aggressive hazardous wastes and special wastes program without being plagued by crisis or serious problems. However, we are convinced that we must proceed now, if we are to preserve the integrity of our natural environment for the generations to come. Now before I get into the details briefly of our new hazardous and special wastes management program, I would like to refer briefly to the European experience and how countries such as Denmark, Norway and West Germany have been able to effectively deal with their specialized waste problem. In Europe for example, hazardous waste management is considered an industry and specialized technology is used to treat and dispose of hazardous waste. There are a number of major hazardous wastes treatment plants throughout the mainland and wastes have moved freely between the countries for treatment at specialized facilities. In Nyborg, Denmark and Ebenhausen, West Germany the facility looks like any chemical plant with strict regulations applying to environmental control and public safety. The operation in Denmark is situated adjacent to a community that is only 1 kilometer away from a public beach, and a park, golf course and quiet residential neighbourhood. I would also like to point out, that throughout industrialized Europe, collection stations for hazardous wastes have been set up and formed a network system that has been in place since the early 1970's. At these various hazardous wastes plants in Europe, the wastes that come in are treated in numerous manners. To give you an example, organic and some inorganic chemicals are burned in high temperature incinerators, other wastes are put through chemical reactor processes to render them harmless, alkalies are used to neutralize acidic wastes and vise versa and some wastes are also filtered and otherwise treated to remove solids and some are degraded by bacteria. These plants also operate as secure, double italics, landfills where wastes,

once treated can be stored safely. These landfills bear little resemblance to what we normally consider a landfill. The landfills are monitored on an active and a continuous basis and every precaution is taken to avoid problems. It is this European example that we want to emulate on a smaller scale in Manitoba. I'd like to mention our three phase Manitoba program which was announced last November. I would like to emphasize that during each step of the program, intensive public involvement will take place. We want to ensure that Manitobans, as a whole, understand our situation as it relates to hazardous wastes and that there is a collective decision making process involved for the waste management system that we wish to set up and for the ultimate selection of a specific site or sites and treatment and disposal facilities. During the first phase of the program our Department has hired a Hazardous Waste Coordinator to be responsible for implementing the program. This new Coordinator was appointed last year and will be doing a fair degree of travelling and will be meeting with various urban and rural municipalities to discuss our program and ensure that all concerned are heard. Another major element of our first phase of the program is this symposium. An eight-member non-governmental Steering Committee was appointed to coordinate the symposium and this group represents a good cross section of Manitoba's populace. I'm sure that many of you may know various members of that committee. For your information Bill Kennedy on my right, the Chairman of the Manitoba Environment Council is our Chairman. I want to emphasize that the symposium was not intended to be highly technical, or dominated by highly technical discussions. It was designed primarily to be a layman symposium . As a government, we will be listening very carefully and attentively to both the ongoing discussions and particularly to recommendations that may come from you. We want to hear Manitoban's views in concerns about hazardous wastes so that they can be incorporated in the early stages of our program planning. Another objective of the symposium will be to provide a vehicle for the transfer of information to you and to the population, so that we can all become a part of the solution instead of contributing further to hazardous wastes. It is also our intention, as part of the first phase, to introduce comprehensive and enabling legislation at the coming session of the legislature. And this new legislation will be dovetailed with the provincial

component of the Federal Transportation of Dangerous Goods Act. The legislation will begin to give us a handle on hazardous wastes inventory, which is difficult at the present time, and on the flow of hazardous wastes in Manitoba, thereby putting us into a position to put into play proper handling and control mechanisms. Provincial governments must develop legislation to deal effectively with waste disposal in order to protect public health and environment and before such legislation can be implemented properly each province must ensure that there are either facilities for disposal of hazardous wastes within its boundaries or in cooperation with other jurisdictions, should establish facilities on a regional basis. Municipalities should of course become involved in order to provide a supportive role in the selection and establishment of waste disposal sites. The development of a totally reliable tracking system to follow the transportation of wastes right from the point at which they are ready to leave a factory or plant until they are destroyed or safely and permanently contained is essential. This system, called closed loop, is possible once provincial and municipal governments have designated environmentally accepted sites. This manifest system should be used so that both wastes generator and the control agency can be assured that any particular waste has been received by an approved disposal operator. In addition to listing hazardous wastes, the manifest forms should specify any special safety information such as the compatibility of the wastes if mixed, the reaction if exposed to fire etc. as well as the means of disposal. It should be identified for each wastes along with a list of approved disposal facilities together with a statement of the types of wastes each can receive. Dr. Bowen:

In the new legislation, we will be ensuring where possible that the new act will incorporate the concerns of all parties that may be directly and indirectly affected. Another element of the first phase in special waste management program, will involve formal Clean Environment Commission hearings expected later this year. The Commission will be entrusted with a twofold mandate. No one, to determine via public hearings the criteria necessary for site selection and two, to determine via public input, the nature of the facility and system required for Manitoba. As I indicated, these hearings are expected to take place this year and they will be held by the Commission in a

number of communities across Manitoba. These then are the principal components of the first phase of the program and once we have completed this undertaking we will then be in a position to move to phase 2 which incorporates detailed sites selection and identification. The designation of wastes disposal sites is a singular, most critical need at this time. Steps must be taken to ensure that site designation takes place as quickly and as efficiently as possible while still respecting the democratic process. In so doing, it must be recognized that we are all faced with substantial expenditures of time and money and engineering work, environmental impact assessments and preparation for public hearings. Is it not reasonable and in the public interest to try and establish procedures that will ensure a final decision can be reached within a reasonable length of time? Phase 3 of the program will involve the actual construction of the treatment and disposal facility as well as implementation of the hazardous wastes management system. Once the sites are chosen it will be equally important to manage them in a safe and secure manner. Constant supervision and monitoring will be required and the cost of that supervision and monitoring must be built into the fees or charges for the use of the waste disposal facility. Perhaps we should give thought to having land titled documents covering disposal sites locations clearly specifying that the land is being used for wastes disposal. Would it not be wise to ensure that such sites are not used for any incompatible purpose in the future. Regarding public participation, I draw your attention to a report assembled in response to a request from the Public Participation Branch of Alberta's Department of Environment, which concluded that public opposition rises when citizen's do not perceive the facility as solving local problems. They feel no need to solve a problem they did not create and to benefit cost is not an issue. The public perception was said to be, that the need to protect human health and the environment from hazardous wastes far outweighed the financial cost involved. As I noted before public involvment is an important feature of our program and will be embodied in each step of the process. Recycling is also going to be a very important element of our program and it is not just our intent to establish a lone treatment and disposal facility in Manitoba, we will also be discussing and encouraging industry, to encorporate where possible, recycling and reprocessing of

hazardous wastes. In this respect, I know that California has instituted a number of progressive tax measures to encourage industries and municipal governments to do this very thing. All of us individually have placed heavy demands for consumer items which all generate substantial quantities of hazardous waste. We have also, all therefore been part of the problem and we are now faced with it today. Therefore we must all do our part to take our responsibility on and resolve this situation. As indicated at the outset of my address, we owe it to the future generations to take action now, to ensure the future integrity of our environment. As research progresses, more and more wastes are being reused safely and profitably and this trend will undoubtedly continue. Meanwhile we need to dispose of wastes and treat it safely so that we can protect the health of the citizens and the environment. In summary, I would say that we in Manitoba will do our part to see that the dioxins and the betanaphalines and the algae do not have the last laugh. Thank you.

Mr. Kennedy:

Thank you very much Dr. Bowen. We are, as you can see, running a little bit behind. I will entertain a short few questions from the floor to Dr. Bowen and then we'll break up for lunch. Yes Ma'am?

The Floor:

I would like to ask Dr. Bowen, is there still the illegal dumping of hazardous wastes going on?

Dr. Bowen:

I'm sure there is.

The Floor:

What are you doing about it?

Dr. Bowen:

That's what this hazardous waste and waste management program is all about.

The Floor:

Several years ago a report was prepared by the Engineering firm of W. L. Wardrope and Associates of Winnipeg. It was an inventory of all the hazardous material and there are 31 million gallons a year of pesticide wastes and you said there's not a Love Canal situation here, well that sounds pretty bad to me and also the Canadian Environmental Advisory Council Report states that each year Canadians spread more toxic pesticides throughout the environment than are buried in New York State's Love Canal. That's a year! On the prairies. And another thing, a great deal of concern is expressed about those residues of these containers on the farms. There was 1/2 million containers, 1 gallon containers a year, I believe. Now if the residues cause all that damage what about the rest of the stuff that was in the containers? That went someplace.

Dr. Bowen:

Yes, that is one of the problems with the use of pesticides that very little actually reaches the pests, the rest has to be absorbed by the environment.

The Floor:

Well it seems to me that the farms are disposal sites themselves.

Dr. Bowen:

Last summer we had a pilot project, involving summer students and two machines that the Department had constructed. We moved into a number of municipalities and crushed and punctured the cans and drained them. The drainings were drummed and were taken to our temporary hazardous wastes storage system in Gimli and later sent out of the Province. The cans have been examined for shredding and possible use by Manitoba Rolling Mills.

The Floor:

But that still doesn't answer my concern about what was in the containers, I mean the gallons, if there was 1/2 million gallons a year that means 1/2 million gallons of pesticides are put in the ground. Now surely, if the residues reach the rivers and the water, then where does this go?

Dr. Bowen:

The use of these materials Madam is legal.

The Floor:

I'm aware of that, that is not my question. I said where do those gallons, those 1/2 million gallons go that are put on the ground if those residues are so hazardous. Then all these gallons, what do they do?

Dr. Bowen:

They break down eventually, they are biologically degraded.

The Floor:

Break down into what?

Dr. Bowen:

They are harmless components.

The Floor:

No, No chemical

Dr. Bowen:

Oh yes Madam.

A Lady:

No chemicals ever goes. No. if he can't tell me where the gallons go, that's my last question, no. Thank you.

Dr. Baldwin:

Dr. I just wonder if I can get some clarification. My name is Dr. Baldwin from the Department of Pathology at Health Sciences Centre. I was just wondering what you intended as far as the symposium is concerned with regards to the process of collecting information from individuals or from groups who wish to comment upon hazardous wastes. For example, I can't spend this afternoon and tomorrow at this meeting because I have other commitments.

However my Department has concerns and comments to make with regard to some very special requirements related to pathology and to laboratory medicine with regard to hazardous and special wastes. Do you want a deposition to the Chairman?

Dr. Bowen:

There are two routes that you can take Sir. One is to make such a presentation, delivered in person or mail it to the Department or if you prefer to wait for the Clean Environment Commission hearing which will take place later this year and submit it to the Commission because I know that the Department and our Minister would be most interested in receiving them.

Dr. Baldwin:

O.K. Thank you. The other question I have is, what sort of processes is envisaged for abstracting medical evidence? For example, of which there is an enormous wealth with regard to things, like asbestos for example, so that it does get to the right people and obviously what Dr. Nicholson was talking about earlier, a great deal of that evidence has been known for a long long while and yet we constantly come across this situation where that information is not necessarily getting to the right people. It,s in the literature and so on and I was just wondering what's envisaged as far as some sort of coordination is concerned.

Dr. Bowen:

I would like to see a group, not an individual, a group of medical scientists and physicians to examine the material at hand, that is under question and advise.

Dr. Baldwin:

Thank you very much. Thank you.

Mr. Kennedy:

Thank you very much Dr. Bowen for your address and I would like now to formally break up the symposium for lunch. We will be starting back

sharply at 1:30. Hopefully we will have a little bit more room by expanding a wall. I want to ask the speakers for this afternoon to meet immediately or to meet with me right now just at this far end of the front table, in particular Ken Simpson, there he is. Hi Ken. I'd also like to see John Richardson, here he is and in addition to that Axel Szelinski.

Mr. Kennedy:

Good afternoon Ladies and Gentlemen. We're going to unfold with the second half of our Wednesday session on the symposium. I'd like to make a very brief introduction of the people at the front table to you. Firstly on my left is Dr. Donald Chant, who is President and Chairman of the Ontario Waste Management Corporation. On my far right Mr. John Richardson who is the President of Chem Security Limited from British Columbia and beside him Mr. Ken Simpson who is with the Department of Environment for Alberta. More detailed introductions and some biographical notes later. In order to get underway we're going to have a look at a very brief slide presentation that gives you, I think, an outline of the Province's proposed program, 3-4 year program that Dr. Bowen spoke about, that is going to be put in place over the next few years in order to handle the hazardous wastes problem in Manitoba. Laurie?

Commentator:

Manitoba's Environment is a precious resource. Agriculture and Tourism both depend on the health of our environment and Manitobans enjoy the outdoors in every season but Manitoba is also an industrial province. It has a very modern society. Manitobans enjoy technology in every day life. Garbage is an inevitable biproduct of our work and play. Through history one kind of garbage has been treated pretty much like all the others. That's no longer good enough. Every Manitoban produces some wastes that need special handling if our environment is to survive our lifestyle. These are what we call hazardous or special wastes. They include hundreds of every day products, from paint thinner to drain cleaner. For instance when we change oil we create special wastes. Most industrial processors, whether at a local

body shop or at a large chemical company, produce some quantity of special wastes. The hazards vary. Some wastes could penetrate the soil to contaminate wells and threaten livestock or even the general population. Traditional landfill sites can't handle these chemical wastes.

In Europe there is a regular industry for treatment and disposal of potentially hazardous wastes. Sophisticated technology is in daily use. Waste collection and transportation is closely regulated. At treatment plants, acid wastes neutralize alkalines and vise versa. Many chemicals can be incinerated without creating pollution. Many poisons can be put through chemical reactions that leave them inert and harmless. Evaporation leaves behind residues that are easy to treat and contain. Special landfill sites allow safe storage of treated wastes for a long long time. Manitoba can learn from experience elsewhere. Although our problem is not yet acute, Manitoba Environment is looking to the future. Legislation will enable the Department to plan to develop a management system to suit Manitoba's needs. We're working on this problem today before it becomes critical tomorrow. Manitoba is moving through three stages toward building a new industry that will solve the special waste problem. Part of the first phase is a symposium in Winnipeg in March 1983 where international speakers describe problems and solutions experienced elsewhere. Manitobans at the symposium study this information in separate workshops. And the symposium arrives at a set of recommendations for the Manitoba Minister of Environment. The Coordinator of Hazardous and Special Wastes addresses meetings across the Province. Clean Environment Commission hearings gather technical and public input to reach criteria for choosing the best site for the new industry. Then in phase 2 site selection begins in earnest. Criteria are applied to form a short list of possible sites. Public consultation through community meetings must precede the final choice. Only then, in phase 3, would construction begin on a treatment and disposal industry which could mean an investment of millions of dollars in Manitoba's future. It's a long and cautious course to travel but its important to Manitoba that we develop a special wastes industry in the 1980's rather than delay until the problem is acute. Effective planning makes it possible to do it right with a complete understanding and wide agreement of Manitobans.

If you would like more information on the why's and how's of hazardous and special wastes ask us. We want to hear your suggestions now so we can work together for tomorrow.

Mr. Kennedy:

Want to make a brief announcement concerning workshops tomorrow. All people here who would like to participate in workshops, please ensure that you are registered for a workshop at one of the registration booths by the end of the day. Also, if you wish a copy of the proceedings from the symposium which will be published in about a month's time, please make sure that the registration desk has your address, so that we can send you a copy of the report. We're making a slight change in the agenda for this afternoon and we're going to be starting off with the presentation on the Ontario experience by way of biography and by way of introduction to Donald Chant. He is a native Torontonian. He is the writer and co-author of more than 70 scientific papers and 7 books on the environment, insects and toxicology. Over the past 38 years he has held positions in the Federal Department of Agriculture, at the University of California and the University of Toronto, and has served on numerous international federal and provincial boards and committees associated with such fields as agriculture, fisheries, biology, toxicology and environmental problems. Dr. Chant was a co-founder of Pollution Probe when it first began. He was also the first director of the Joint Centre for Toxicology at the University of Toronto and at Guelph University. In 1967, he became the Chairman of the Zoology Department at the U. of T. and was then Vice-President and Provost to the University from 1975 to 1980. Added to his many responsibilities, as Chairman and President of the Ontario Waste Management Corporation, Dr. Chant is also Chairman of the Scientific Advisory Council of the World Wildlife Fund for Canada. Interestingly he was also the first Chairman of the Canadian Environmental Advisory Council. Dr. Chant holds degrees in Zoology at the University of B.C. and has a Masters and a PhD from the University of London in England. With those few introductory remarks, I would like you to welcome Dr. Donald Chant.

Dr. Chant:

First I would like to thank the Manitoba Environmental Council for asking me to participate in this symposium. While speaking on the subject of site selection and industrial waste facilities is rapidly becoming almost a full time profession for me, almost on a daily basis nowadays, I must admit that I welcome the opportunity to do so outside Ontario and in front of an audience that is not convinced that the simple fact of my presence in Town is a signal that some major site announcement is only one sentence away. Most places I go, I'm about as welcome as a skunk at a garden party but I sense I'm no threat to you. At least I hope I'm not. The issue of communicating and working with the public in the selection of industrial waste sites is a complex one, containing social and political considerations that few, if any jurisdictions here in Canada or in the United States have had much success in resolving in recent years. I don't propose to analyze all the factors for that today, which would be hardly a wise task for a simple professor of Zoology who specializes in insects and mites, but I do want to touch on some of the major considerations involved in public consultations and the toxic industrial waste management issue and to tell you a little bit about how we are trying to deal with these in Ontario. Before I do, I think I should spend a few minutes summarizing for you the nature of the industrial toxic waste problem that we face in Ontario, what the Ontario Waste Management Corporation (OWMC) as a Provincial Crown Corporation has been created to do and how we're approaching this task. Perhaps I should begin by referring to some of the more obvious illustrations of the problem that we all face today. I'm sure everybody in this room has heard of the notorious Love Canal. It conjures up images of boarded up homes, angry mothers screaming at government officials and drums of chemicals lying like time bombs below the ground surface. Yet there are several matters that must be considered about Love Canal that I think we can learn from that sad experience. First, the Hooker Chemical Company did what it felt was best at the time. During a 10 year period, ending in 1952, it buried 200 thousand tons of chemical refuse in Love Canal. Secondly, the Board of Education did what it felt was best at that time and built a school there. As times passed School Boards changed and it was forgotten that a chemical time bomb was buried under the soil. And

eventually, Planning Councils of the City of Niagara Falls, New York forgot what lurked below the surface and approved the development of subdivisions over the old landfill. As the decades passed, the results became obvious. I don't need to go into the details of them today. If it weren't so tragic, it would be a comedy of errors but the four key errors that I think were made, and from which which we can learn were as follows: First of all, the Love Canal dump was simply a hole in the ground. It wasn't engineered in any way, shape or form, it was simply dug there. Secondly, the waste that went into it, the 200 thousand tons of waste that went into it were completely untreated. They were just raw toxic wastes as they came from the generators. Thirdly, there was not post closure, responsibility or liability assigned to anybody. Once the dump was full, once it was closed, those who had operated could walk away free of any responsibility. And fourthly, it was sheer insanity to allow the building of school and subdivisions on top of that closed dump. I think those are four loud and clear DONT'S that should guide all our activities in the future in trying to determine how to handle best the toxic industrial wastes that we must handle. In Canada, of course, we've had our own problems. Environment Canada has estimated that 3.3 million tons of liquid industrial and hazardous wastes were produced in Canada in 1981. In Ontario, we, the Crown Corporation, have recently released a waste quantity study which estimated that 1.5 million tons of liquid industrial wastes is generated in Ontario per year. That, incidently, is about 40 times what I understand to be the current Manitoba estimate of 45 thousand tons. In Ontario we think we have 1.5 million tons. About 50-60% of this material is receiving some form of treatment at the present moment, either by the generator on plant, by the private sector or by being recycled. The rest untreated is either being sewered or placed in landfills that frankly are not designed and not properly engineered for that purpose. We call this 1.5 million tons special wastes. I noticed that you have a somewhat different label for them. Special wastes, as we define them, are toxic wastes that cannot be treated by the conventional methods of sewage systems or in conventional municipal landfill sites. They require special treatment, therefore they are special wastes. There are presently eight licensed landfill sites in Ontario which are legally licensed to receive this material

today, which is a long way removed from the hundreds of sites thoughout the Province that were in operation prior to provincial waste management laws coming into force in 1971. In 1979, the Ministry of the Environment began to look for abandoned sites and uncovered approximately 800 dumps in Ontario, with the possibility that there might be 2-3 thousand more in Southern Ontario alone. While few of these are likely to contain highly toxic materials in large quantities, it is clear that we too have environmental time bombs sitting around the Province waiting to be uncovered. As far back as 1976, Ontario's Ministry of the Environment recognized the urgent need to address this problem of toxic wastes. In the ensuing years, the Environment Minister at that time, Dr. Harry Parrot, proposed the establishment of waste mangagement facilities at at least 3 locations: Harwich Township, south of the Town of Chatham, and in Thorold and Ajax. In each case, the Ministry of the Environment found concerned citizens carefully scrutinizing their proposals and ultimately, each proposal was rejected or abandoned due to technical factors and public oppositions. As these battles progressed, of course the waste did not go away, nor did they lessen in quantity. At this point, in November 1980, the creation of the Ontario Waste Management Corporation, a Crown Corporation, was announced. A site was also chosen by the Government at the time of the announcement of O.W.M.C. It was the site on Crown Land at South Cayuga, a Town about 70 miles south west of Toronto. There was no prior discussions of the announcement. The good folk of the north County in which South Cayuga is located woke up one morning to find that it had been announced that the site would be in their area. No ifs, ands or buts. The proposal was specifically by the legislature, exempt from the Environmental Assessment Act and no public hearings were to take place. Construction was to begin as soon as possible and the Waste Management Corporation, the Crown Corporation, was to be responsible for building and managing the facility. I don't want to go through the history of O.W.M.C. in detail but I would like to pause here and underline four important points that stem from that series of decisions by the Governement. In fact these were four conditions that I insisted on, to Premier Davis and Dr. Parrot, the Minister, before I would accept appointment as Chairman and President of the Corporation. I think that they are conditions that have an important bearing

on the approach that we are now taking to selecting sites. The first was, that I insisted to the Premier, that even though the Government appeared to have chosen South Cayuga as the site; further, more detailed hydrogeological studies had to be done, on the proposed South Cayuga site prior to any final decisions being taken to develop. Second, I insisted that although the Government had exempted our activies from the Environmental Assessment Act, there had to be a Government appointed hearing panel, completely independent of O.W.M.C., to hold public hearings on any proposal that we might decide to make for that site, with the power to reject our proposal if the hearing panel did not feel that it was safe and suitable. As an adjunct to that, even though exempt from the act, the Corporation has voluntarily, the Board of Directors of the Corporation, has voluntarily decided that we would use the definition of Environment that is in that Act. It's one of the best definitions of Environment in the world, in my view, and even though we're exempt from the procedures of the Act, we will conduct a full environmental impact assessment of our proposal and the hearing panel will judge it as if we were not exempt from the act. In other words we intend to act as if we weren't exempt. And we have now this independent hearing panel devoted to our proposals. Thirdly, I insisted that because the hearings will, by definition be highly technical in nature, that eligible public participants in the hearing receive financial support to be provided by the Ontario Waste Management Coroporation. This is a precedent in Ontario, I might add. I don't know the situation in Manitoba. The funding of public intervenors in a hearing process. And finally, I received the Premier's assurance that Cabinet would not interfere, if the Waste Management Corporation decided following our further studies, to reject the South Cayuga site if we chose to do so. Well, to make a long story short and as you may know, preliminary hydrogeological and geological studies at the South Cayuga site conducted by us, revealed that it had several short comings for a secure landfill which was central to the South Cayuga concept. And our Board of Directors voted unanimously to reject the site in November of 1981. And I can tell you that the Premier and the Government Cabinet lived up to its commitment. There was no shadow of attempt to interfere politically with our decision. Mr. Davis received it with great equanimity. I think I might pause, Mr. Chairman, at this point and just make

a few comments about the Crown Corporation. It was clearly established, through a feeling of intense frustration on the part of the Minister of the day, Dr. Parrot and the Government, that the private sector had not seemed able to come to grips with this problem and the Ministry's attempts to establish facilities had fallen apart in the face of public opposition and various other factors. A Crown Corporation such as ours has an independent board of citizens, who are not advisory to the Government in any way whatsoever. They have the legal authority and the legal responsibility to run the Crown Corporation independent of any interference from anybody but in this context from government. I report through the Ministry of the Environment, not to the Minister but through him to Cabinet and to the Legislature, as Chairman of the Board of the Corporation. And Fourthly, I think a point that is worth mentioning and harping back to what I said about Love Canal, that the Crown Corporation approach was the only one that the Government could think of, whereby post closure of facilities, responsibility after closure of facilities could be assured that the Crown Corporation will forever have responsibility for its landfill or whatever the facility might be after it has lived its useful life. We cannot move on. We cannot give it to somebody who'd build a school on top of it or a shopping centre or a subdivision. We will be responsible for monitoring it and taking care of it for all time. I should point out also that the Crown Corporation is not a regulator or a policeman. We don't pass legislation. The Government does that. We don't set regulations. We don't police them. In my view it would have been an intolerable conflict of interest if the Crown Corporation policed itself. We will be policed the same as anybody else is. And Secondly, we are not responsible for garbage and we're not responsible for nuclear waste, I am happy to say. With the rejection of the South Cayuga site, we changed over-night from a one issue organization, building a waste treatment facility in South Cayuga, to an organization faced with the task of developing a world class industrial waste management system, not a single facility but a system, a provincial system for Ontario and finding the appropriate site or sites somewhere else in the Province. It quickly became apparent that we faced several critical tasks. The tasks of gathering and analyzing data never collected in the Province before on the types and quantities of waste

generated and on available treatment technologies. The task of developing a plan that will result in facilities being built as soon as possible. The task of overcoming public hostility, cynicism, and fear and of providing opportunities for input and discussion at each important stage as our plan moves along. I cannot, Mr. Chairman, emphasize enough the importance of a clean plan that anticipates issues and problems and decides in advance when and how they are to be solved. The impact of waste management facilities in communities could be significant. We all know that. And without a clearly articulated process that identifies and measures these impacts, the project could have serious consequences. We have now completed two phases of a five phase plan that will lead up to the public hearings on our proposal. The first phase involves the collection and analysis of key information on waste types and quantities, on available treatment technologies, on the hydrogeology of the soil conditions of Southern Ontario and on the options that we needed to assess. It ended last September, the phase one, with the phase one report which was distributed to literally thousands of people, you know in Ontario. Phase two which ended in January, 1983, assessed these options in more detail and narrowed our search for facilities into the areas of the Province where the highest percentage of wastes are generated. In other words we decided to concentrate on the so called Golden Horse Shoe, running from Oshawa in the east around the west end of Lake Ontario through Toronto, Mississauga, Hamilton, Burlington, down to the Welland, Niagara on the Lake, Niagara Falls, and Ste. Catherines area. We are now in phase three and hope to identify specific sites for more detailed study within the next several months. If I can summarize that process, in September, 1982, last September, we identified the end of phase one of our work, we had the waste quantities estimate, the 1.5 million tons, which incidently if you're like me it doesn't mean very much, that happens to be 330 million gallons. I can relate to that more. I'm told that's equivalent of 18 thousand swimming pools so I can even relate to that more clearly. We identified 3 generic technologies that we are going to use. A complex of technologies that will be a physical chemical treatment facility. A rotary kiln for high temperature incineration of certain organic wastes and the establishement of an engineered landfill site. I won't go into great detail but engineered to an extent that there is no counterpart in North

America and very few counterparts anywhere in the World. And we had done that survey of the hydrogeological soil conditions of Southern Ontario and found that there were many places that appeared to have the kinds of soils, a deep impermeable uniform clay that we were looking for. In January then, we narrowed down to the Golden Horse Shoe, basically for three reasons: One is that 70% of the waste generated of that 1.5 million tons, is generated in the Golden Horse Shoe. This led to the second point, that transportation costs and risks suggested that the treatment facility should be as close to the generator of most of the waste as possible. That led us to the Golden Horse Shoe. Thirdly and much more intangibly, a certain element of social justice is that it seems to us that the communities that enjoy the benefit of producing wastes in terms of employment, in terms of tax basis and that kind of thing should have a major responsibility for getting rid of the wastes who's benefits they enjoyed. If I can put it that way, and that said put it in the Golden Horse Shoe because that's where 70% of the wastes, presumably 70% of the employment is based. In April, next month, we will announce candidate areas within the Golden Horse Shoe, narrowing it down further in our search for sites. And the factors that will be stirring that selection of candidate areas, will be the hydrogeology, the soil conditions still, the access to major sewage systems that have unused capacity, because of the physical chemical plant and the incinerator both have a grits effluence that are best handled in a sewage system. Air shed characteristics, we don't want to add to over burdened air sheds with the emissions from the incinerator and even though we'll use the world's leading technology to cleanse those emissions, there will be emissions. There is a limit to what the world's leading technology can do.

Dr. Chant:

In August we will announce a few candidate sites in our order of preference, based on the information we have at that time. These will be specific sites, lot and concession number sites and will use further aspects of the factors that I've mentioned and in addition, at this stage social economic factors will enter the picture and general environmental factors, environmentally sensible areas for example. And a number of other factors. After we've announced those candidate sites, a few candidate sites, we will

then do full environmental impact assessments on them. We reckon that this will take about a year to confirm or otherwise our priorization of those sites and to select the one that we intend to go forward with to the hearing panel, when we have done the requisite background work. During this process, to date we've met with over 400 groups across the Province to explain what it is we're doing and how we're doing it and to seek their advice and their contributions to this process. And I think, Mr. Chairman, that I can summarize very briefly some of the key messages that we received in those 400 plus meetings to date. First of all, of the thousands of people that we've talked to represented in those 400 meetings, not a single person has disagreed that we, in Ontario, face a major problem posed by these vast quantities of toxic wastes and that the problem has to be solved as quickly as we can. I suppose to an audience such as this, where you obviously share that feeling, that may not be suprising. To me it is suprising that in those thousands of people not a single person said "what's the problem, don't worry about it, it's okay". Having said that, of course, there is no unanimity on how the problem should be solved but at least have a common base of appreciation of the problems there in the first place. Industry obviously wants us to find a landfill site right away. The safe disposal of liquid industrial waste is an immediate problem. On the other hand many environmental and public interest groups want us to go on with reduction, re-use and re-cycling of wastes and then develop technologies to dispose of the wastes that remain after those processes have been put in place. Small rural communities want us to stay away from agricultural land, in fact stay away from them entirely and place facilities in major cities where they feel the problem was created in the first place. I guess I'd have to say the favorite place for the location of waste facilities in rural Ontario is at Queens Park. Not very realistic. Unfortunately the soil isn't very good there. Gradually however, we began to get some consistent messages in all these meetings. Don't concentrate all your efforts on simply looking for a landfill site. Encourage and assist industry to reduce and recycle as much of the waste as possible. Make sure you have explored all available options from large scale centralized waste treatment facilities to dispersed facilities and use only state of art treatment technologies, use proven technologies but don't embark on gigantic experiments

with unproven technology where in fact the 9 million people of Ontario would be the guinea pigs. Do not sacrifice environmental standards for other factors. Environmental standards are basic and not to be compromised. And don't rely on engineering as your sole line of defence. I'll come back to that point in a minute. Above all, the public tells us, do it right. We can't afford any more false starts. And we won't tolerate any surprises in the future, like the good people of South Cayuga were presented with 2 years ago. I watched very carefully in all these meetings for the so called Nimby syndrome, not in my back yard and it's there. There's no doubt about it, but one thing I think that I have detected is that the more people know, the less they have that knee jerk Nimby reaction. And at the present time when people tell me you must stay off agricultural land or you must not come to our community because we have been burdened enough with a garbage dump or an Ontario Hydro transfer station or something, I put the question to them "Would you tell me, when we know all the facts, that we should go to a second best location to stay away from your community" and the answer almost invariably , I'm delighted to say is "No, well no, don't go to a second best site, we know there is a problem, it has to be somewhere and if the best place for it, after you have done all your work and talk to us and all the other people, is in our neighbourhood then, we don't want you but we'll have to face reality and we would accept it under those circumstances, but only under those circumstances". And finally, what I think I detected from the public in contrast to 2 years ago, 2 years ago when I first embarked on this, many many people would say "well, yes there is a problem but it has nothing to do with me, I live in the country and I don't make wastes or anything like that" and through a process of explanation and discussion I think people have come to realize that we all create waste, we may live in the country some of us but we buy things and we consume things. We use pesticides, we use fertilizers, tractors, batteries, cars, television sets and on and on and somewhere, somebody in trying to produce those goods to satisfy our needs, created wastes and therefore all 9 million people in Ontario, in my view, share the responsibility for solving the problem. It's not a question of guilt, it's a question of shared responsibility and I'm happy to say that I think that more and more people have come to realize that that is so. And I was pleased to

see that item touched on in that slide show. It's an important point. As we begin to narrow our search for sites over the next few months I realized that inevitably however, we will face local opposition. This is a natural reaction but it need not turn into an emotional outpour that results in political upheavals and for prolonged litigation across the Province. We must find a way to solve these problems of selecting sites and perhaps I should conclude by offering a few suggestions, Mr. Chairman. First, the selection process must be a credible one. One that the public understands, has an opportunity to participate in and one that is thorough in its evaluation of social as well as technical factors. To be credible it must be open. Studies must be made public. Answers must be given to questions and concerns. And the Government or private operator must show clear evidence that he has listened to and heard the public's concerns. There is no half way measure with respect to openess, you are either totally closed in my view or you're totally open. There is no middle ground at all. Second, the plan must be developed that provides for input before, not after, major decisions are made by the Corporation. Rushing to sites and then trying to justify the decision later is asking for trouble. There is abundant evidence to support that point of view. Third, the public is very skeptical of industrial waste treatment practices and in many instances this is understandable. Their perception is that a site consists of a hole in the ground where trucks dump their raw, untreated liquid toxic chemical wastes. A great deal of time and effort, utilizing the best communitication skills we can muster, is needed to illustrate and explain how treatment of waste prior to storing the residues in a landfill actually works and how we intend to store and monitor those residues once they're in the landfill. Technical experts in these areas must become good communicators or their projects will be challenged at every opportunity. Fourth, the selection of appropriate sites and treatment technologies is an enormously technical, time consuming task requiring the completion and the evaluation of dozens and dozens of separate technical studies. If members of the public are going to be asked to participate in this process and in a formal hearing to assess the results of our work, I believe they should have access to technical expertise of their own, to help them evaluate the proposals. This means public funding. I commented on that already, but public hearings in themselves

should not be the sole opportunity for public input. A hearing is a very legal technical process and only the most committed and tenacious will participate. If it is the only opportunity for involvement it is a lost opportunity for most people. I'd like also to outline to you a few key policies established by the Board of the Ontario Waste Management Corporation that may be of interest to you. First of all, in wrestling with the question of what capacity should we design for our facility, we say there's 1.5 million tons out there, we say about 1/2 of it is now being treated or recycled, what should we be designing for? And our Board decided we will never know. The picture is shifting all the time. Very difficult to get detailed refined information on waste generation. What we should do instead is adopt the principle that we will design considerably below what we think the eventual capacity should be. In other words, start at less than we think the final capacity will be, but start big enough, certainly big enough, so that we make some substantial impact on the problem itself. It is suggested to us to start our position at about 150 thousand tons treatment capacity per year, which I think Ladies and Gentlemen would make us the largest treatment facility anywhere in the world, even at 150 thousand tons. Secondly, we have adopted the position that we have a social responsibility as a Crown Corporation to be a full service facility. We cannot pick and choose the wastes that we will treat in a way that private industry can. And I don't say that pejoratively at all. But we, as a Crown Corporation, have to be prepared to treat all of the kinds of wastes in Ontario that require treatment, full service. The Board has determined that we will use the World's best proven technology, not the cheapest technology, but the best technology and we presently calculate that the capital cost of our facilities will be in the neighbourhood of 80 to 100 million dollars. Our Board has determined that environmental factors must be used as a second line of defence. We can engineer and engineer and engineer but when all is said and done nobody can issue a 100% guarantee that engineering won't have faults in it. None of us is perfect. And that being so, we must look for environmental factors that will provide the second line of defence: deep clay, uniform clay, the air shed qualities and these kinds of things, as a back up to whatever engineering we do. We have, as I indicated, determined that only treated wastes will go into the landfill. No

wastes will go into the landfill in an untreated, raw condition. We will encourage reduction and recycling as a very deliberate, in fact we are at the present moment, a very deliberate program of the Waste Management Corporation in the conviction that that's the best way to treat waste so you don't have to detoxify them and store them in landfills in the first place. We will work with the private sector. We have no ambitions to become a monopoly and drive out the private sector in the waste treatment business in Ontario. My feeling is that if the private sector, with a given waste is doing an adequate job, then we will work with them, help them, cooperate with them, and not compete with them. And that would include generators, treaters of wastes in the private sector and the transportation industry. If they're doing an adequate job, more power to them. We will try to establish a break-even operation as far as costs are concerned by charging for our services in the conviction that we should not be a continuing drain on public funding in the Province of Ontario if we can possibly operate on a break-even basis. We believe very strongly that we will not be successful in attracting to us the wastes that do require special treatment if we are not reinforced by the regulations and the way in which they are applied by the Ministry of the Environment. We're committed, as I said to openess and full consultation. We are committed to there being no surprises in future for anybody in the Province of Ontario. We've determined that although we are exempt from the Environmental Assessment Act, we're going to act as if we were not exempt from that Act. We're going to take the time to do it right. There is a terrible tendency to become impatient, to want to speed up the process but we're not going to do that. We're going to take the time to do it right. We've been working at this for two years now. It'll probably take us four more years or so before we can commission the facilities that we hope to build. We cannot predict how long the hearings will take. It's an independent Board, an independent hearing panel and they will take as long as they think they need to take. But in my opinion, my conviction is that by doing it right in the first place we'll save time in the long run and I make no apology for that. Mr. Chairman, we in Ontario don't have all the answers on the subject. It may surprise this audience to know we don't have all the answers on any subject in Ontario. Indeed we are going to run into opposition and frustration, no doubt before

the facilities are in operation. But I believe that we all must share in the solution as consumers of products we all need and demand but which create wastes that must be properly treated. These solutions are available but they will only become available to us if we act sensibly and openly with a well thought out, thorough solution. Thank you very much Mr. Chairman.

Mr. Kennedy:

Are there questions for Dr. Chant? One. Perhaps if you could move to that mike if that's convenient.

The Floor:

I would like to ask you Dr. Chant, do hazardous wastes keep better under very very cold conditions?

Dr. Chant:

Do you mean keep in a landfill?

The Floor:

What I mean is that they do not emit fumes and things like this better under cold conditions.

Dr. Chant:

In the raw state, yes they would emit fewer fumes simply because the vapor pressure would be different at very low temperatures but in the ultimate storage of the treated residues and landfill it doesn't make any difference whether it was cold or hot or anything else that's where they are.

The Floor:

You mentioned that you would be looking for clay sites. Is is not possible to, in spite of costs, move them way up to the northern part of Canada in rock surfaces away from the public?

Dr. Chant:

No not in rock surfaces. Rock is the worst thing you can have for toxic industrial wastes. I'm not commenting about nuclear because I'm not qualified to do that. But rocks, the precambian shield in Canada, is fractured and it's a guarantee that if you try to build a landfill or in some other way deposit in the rocky parts of Canada, it would drain away very very quickly. I'm uncomfortable with the idea of sending it off to some uninhabited part of Canada which means the North. I had one gentleman at one public meeting not so long ago say "send it off to the Hudson Bay. Keep it perpertually frozen. The only people who live there are Eskimos and whales and they don't matter". Well I don't happen to subscribe to that viewpoint. I think transportation risks and costs in social justices say put it as close as you can to where it is generated.

The Floor:

But if you have incinerators and you are having the fumes come up from the incinerators, aren't you poisoning the environment of people who are not responsible for the wastes in the first place.

Dr. Chant:

I don't think you are because I think that modern technology would allow reasonably clean emissions from the stack and of course they'll be monitored, the emissions will live up to all the regulations of the day. If you drive around Ontario's Golden Horse Shoe and look at existing smoke stacks, and this is no excuse, but look at existing smoke stacks sometimes in my darker moments I wonder whether it matters a dam where we put the incinerators when we've got all that to start with. But of course having all of that to start with is one of the reasons that it does matter a dam because you don't want to add to that already overburdened air shed.

The Floor:

But if you're going to put in any place you are going to decide on a site. You're going to have opposition.

Dr. Chant:

Of course

The Floor:

Yes but aren't the length of time people are going to argue on it going to defeat the purpose of having the site in the first place because you won't be able to get it started

Dr. Chant:

I don't think so. If people who have been fully consulted and know what's going on want to come to the public hearings and participate, more power to them

The Floor:

Thank you.

Mr. Emberley:

It's so good to see you after reading some of your writings. It's wonderful to see you in person. I was interested, if I understood correctly when you said earlier in your address, each abandoned site that was undertaken in the early stage in selecting South Cayuga was abandoned due to technical reasons and public opposition. Do you feel in your own mind, that the public was justified in objecting and discovering the technical reasons that made the site unsuitable.

Dr. Chant:

Yes I do very definitely. These sites were chosen without consultation, without proper study and that's the wrong way of choosing a site in my view. If the public is consulted and you do over time the kinds of studies on the proposed site that should be done before you say I'm going to propose this site, then I think that everbody's interests have been well treated. On the other hand doing this the way that I've tried to explain we're doing it, which I think is the best way, we're not running a popularity pole. We'll consult with anybody for however long it takes but we are not

taking any votes as to the communities that would like to have us and those that wouldn't. There are some in Ontario that let me know they'd love to have us unfortunately they don't have the right kind of environment that provides the safety features that are necessary and that is the bottom line to me.

Mr. Emberley:

This is my concern to clearly understand because of our situation, that fundamentally if those early sites and the site like South Cayuga had been proceded with, you would have been in effect trying to and build a program to solve industrial wastes while you would have been constructing a Love Canal.

Dr. Chant:

Yes I don't think I would quite use those words but I agree with your intent completely.

Mr. Emberley:

Your Love Canal, you're not building that kind of site and I believe, with you, that the public will accept a thing that is done absolutely first class and that is the kind of thing we look forward to from you.

Dr. Chant:

Well that's what I hope for.

Dr. Gesser:

Could you say something about the kind of laboratory back-up for monitoring that would go with the site.

Dr. Chant:

Yes, there are three components to that basically. The first is a lab, sophisticated lab that tests every load of wastes that comes in for treatment. This is the system the've established in Europe. You cannot treat waste properly if you don't know what they are basically. It's as simple as that so you must treat every load that comes in. If it doesn't check out as

to what it's supposed to be, then you must do as they do in West Germany and impound the vehicle that brings it in until you trace back and find why there's some variance. Secondly, our own monitoring handles the legal facilities for checking on the appropriateness of what we're doing and making sure that we're living up to the regulations and the permits, and then thirdly of course, the independent government monitoring labs that will also be monitoring our operations so that we live up to test everything that comes in, test everything that comes out and we're subject to government regulations and permits.

Dr. Gesser:

At what stage is this being implemented, I mean, are you setting up these facilities before you have the site, during the site or concurrently.

Dr. Chant:

Well we can't even begin construction until hopefully we have approval from the hearing panel. I mean there is no other way we could go. You can't go and build the thing and then get approval for it.

Dr. Gesser:

But how long does it take to get the experience in handling that kind of facility.

Dr. Chant:

Well it takes a considerable length of time and I don't know how long the hearings will take. But people who press me on time should understand that the average length of time to get approval for a simple garbage dump in Ontario with no sophisticated engineering and no treatment facility is 5.9 years, Well, it may take us a little longer but we're doing a heck of a lot more too, so lengthy processes are part of it. We should have all been in this room 10 years ago talking about this but we weren't and hindsight is always 20-20. All we can do is go on and do the best we can in the future.

Mr. Kennedy

Last question Mr. Gavin:

Mr. Gavin:

Just one small question of clarification. You mention you're planning for a break-even cost recovery. Would this include capital.

Dr. Chant:

No it wouldn't. The Ontario Government's position is the capital would be a free grant in the conviction that all nine million people in Ontario are all part of the problem and therefore it is a legitimate assessment against them but thereafter we should have a break-even operation.

Mr. Kennedy:

Well I would like to, on behalf of everyone here this afternoon, to thank you Dr. Chant very much for coming to Winnipeg and allowing us the benefit of the Ontario experience. I'm aware that some of our Provincial people have been in touch with your Cooperation staff and I would encourage our Manitoba Government Officials to keep in touch with corporations like the one in Ontario and probably in other parts of Canada where there are programs going ahead. I think we can only do better to learn from your mistakes as well as your progress. Thank you very much.

I would like to introduce to you at this time Mr. Ken Simpson, who is the Head of the Waste Management Branch of the Department of the Environment of the Government of Alberta. He has been in that capacity since 1975 and has been working for Alberta Environment for a total of 13 years. Prior to that he has experience in municipal government, in the private sector consulting business as well as in construction. Mr. Simpson has a BSc in civil engineering from the U. of A. as well as a Masters of Science in environmental engineering. With that I would like to introduce you to Mr. Ken Simpson.

Mr. Simpson:

Thank you very much Bill. I'm certainly appreciative of the opportunity to come to this symposium for the purpose of explaining what is

happening in Alberta with regards to hazardous and special wastes. I'm certainly impressed already today with the level of interest that has been shown, not just from the speakers dias, but also from the audience. I think there is a lot of interest here. There is a lot of keen awareness of the problem and there seems to be a very deep resolve to do something about it. And I'm happy to see that you are starting at a very early stage in the process in order to get a handle on a lot of the problems that will be faced in the future. With my talk today I would like to break it down into 4 basic areas. First of all, it's the policy initiative that we are taking in Alberta Environment. Secondly, some of the legislation that we are dealing with. Thirdly, the technology that we've planned to use in our solution and fourthly the siting issue. And it seems that most of these areas have been touched on by Dr. Chant and I think that I may be repeating myself or repeating certain facts again because I think both Ontario and ourselves are learning as we go as it were. We've all made mistakes. We've learned from our own mistakes. We've also learned from some of the mistakes in Ontario and I'm sure the converse is true as well. But before I get into those four points I'd just like to go through some of the background to the problem in Alberta. Like Manitoba we're a semi-industrialized province. We have a bit of industry and that industry is growing, but certainly not at the stage of Ontario, Quebec or most of the Eastern Sea Board of the United States and I don't think that it will ever happen. If it does, I think we will be prepared for it, but certainly we're not faced with a long history of improper disposal practices that those more senior areas have to deal with. In Alberta we're faced with approximately 100 thousand tons of special wastes per year. Again, that is only a little over twice what Manitoba produces. Like Manitoba, we have no proper facilities, no special facilities for the treatment of these wastes. Most of the wastes are entering questionable landfill sites, sewage systems, illegal land dumping. All of these current practices really were not designed for these particular types of wastes and consequently we are faced with possible problems in pollution of the environment and questions of public health. I guess the whole thing started in Alberta with the proposal by a company called Kenetic Contaminants Limited in 1979. They wished to establish at that time, a hazardous waste treatment facility in one of our industrial

towns. Really they went into the town essentially as they would with any industry. They got an option on some land. They hired consultants to design the facility and they called a public meeting to explain this and I think that's where we learned the true meaning of the Nimby Syndrome in Alberta. Following that public meeting which essentially was a re-anactment of some of the scenes we have seen from the Love Canal meetings and some of the hearings we have seen elsewhere, the Government, in his usual way, decided to call a moratorium on the situation stating that no permit for such facilities will be issued until the whole matter had been given a thorough study. This began with the establishment of an expert committee, the Hazardous Waste Management Committee in 1979. That committee, made up of lay people, experts in various fields, consultants as well as government officials, looked at that whole question over that winter and came up with a fairly detailed summary of the situation and certain options for action, approximately in the Spring of 1980. During 1980 that same report was subjected to a series of public hearings by our Environment Council of Alberta. That gave the public essentially what your group will be going through, I understand, in the next year or so, a chance to comment on the options available and to present diverse viewpoints on the whole program. This took place in Alberta in 1980 and the Environment Council of Alberta published the procedings of those public hearings in December of 1980. Then we moved into the next stage, which was a follow-up on several of the recommendations of the public hearings and that was to establish a siting committee. A special committee with the sole purpose of establishing criteria, to initiate workshops in the whole process of going to the people and getting their views on the whole question of siting. But I'll just leave that until I do come back to the specific issue of siting and maybe just move on. Following the various committees that were established and the recommendations received by government, we did manage to get a policy statement through government and if there is any government people here they will know that is not a mean feat to actually get firm decisions. But we did manage to get a fairly comprehensive policy statement which had three major points. First of those points was that any facilities built in Alberta, these are the so-called central facilities as opposed to on-site facilities, any of those central facilities that would be built, would be

built on Crown Land. And this is, as Dr. Chant pointed out, mainly to give the perpetuity control over to that particular site and to ensure that non compatible land uses are really kept off that site, for all time. Secondly, as part of the policy, it was decided that the plant would be owned and operated by the private sector and mainly the reasons that were given for that I guess, was rather a split decision, as a lot of these decisions are. At a lot of the public hearings we heard arguments that if we let private industries do this, they would cut corners to make profits and the public is going to suffer. On the other hand we heard arguments that said, you know, if you think the Post Office is doing a good job with your mail, just wait and see what they'll do with your hazardous wastes. In other words, they don't want, in deference to Dr. Chant I think, there is some skepticism about the ability of government and crown corporation to handle this sort of a problem. So we, I guess, came up with a bureaucratic solution, a compromise, we did allow the private sector to have ownership and operation of the facilities on the Crown Land but we also came up with the third point and that was the establishment of a Crown Agency to essentially oversee the operation. Don't question me too closely on the exact terms of reference on this crown agency. It's going to have to be one of those things where we take it step by step. Basically the Crown Agency has the overall mandate for the safety of the public with regard to the disposal movement, storage etc. of special wastes but they will not be involved in the day to day operation of the facility. And somewhere in there lies a role for this Crown Corporation. Myself I see them having certain monitoring capabilities, perhaps involvement of extra studies being done to satisfy local people and the whole aspect of public participation comes in very much here because of part of our strategy in designing the Crown Agency was the idea of local participation. We've committed that at least one of the members of the Board of Directors of this corporation will be from the local community in which the facility is sighted and secondly we've planned for a local monitoring committee to be set up as an adjunct to the Crown Corporation and that local monitoring committee will have funds made available by the Corporation to carry out independent research and independent studies of the operations of the facility. So in that way we are linking back to the community and giving some assurance that the local people

will have a say in how that plant is operated. So that was the policy statement that came out following through with the private ownership aspects. We felt we had to get the best company possible to build this facility for us. We went to request for proposals about a year ago and we received 19 proposals from the waste management industry world wide. We set up a selection committee with the best people we could find. We brought in European experts, some American experts. I don't know if there is any Manitoba experts on there but there may have been. But we did have a fairly first class selection committee. They short listed the proposals down to 4. I think these were Tricil Limited, Stablex Canada Limited, Gen Star I.T. Corporation and Chem Security Limited. We eventually chose the latter, Chem Security Limited who are experienced in waste treatment and control mainly in the western United States. They do have some activities in western Canada at the present time mainly in the storage and transportation aspects in transporting material to their facilities in Oregon. But we were happy that this company did have the capability and the track record in order to do a job for us in putting the facility together and to operate that facility in the safest possible manner. Legislation, we were criticised during the public hearings of having weak legislation. I think we have corrected a lot of this since 1980 and in fact the spring session of the Alberta Legislature last year brought in 3 bills concerning hazardous wastes, special wastes. The first was an amendment to our Hazardous Chemicals Act which expanded it to allow scheduling of wastes, more specific definitions and it also enabled us to bring in the Manifest System, which was described earlier. And also we brought in the Special Waste Management Corporation Act and this legitimized the Crown Agency or the Crown Corporation which I mentioned earlier. So this covers three of my points and it brings me to the final one of siting. And Dr. Chant alluded to some of the problems we have in siting. He said that when he goes to public meetings he hears "put it in Queens Park". I think not only are we advised to put it in on the Alberta Legislature doorstep and elsewhere, I've often heard of this elusive location called somewhere else and that seems to be the most prefered location for the Alberta waste plant. Unfortunately, I have yet to find the town called somewhere else on my map although I continue to look. I guess because of the problem in South Cayuga

as well as several U.S. scenarios that we studied in details, we began our siting process by stepping back and really trying to figure out what the problem was. The reason I keep bringing up all these dates is I want Dr. Chant to realize who really started this process of public participation. About the time the South Cayuga site was announced, I think we were already well into our public participation program where we were stressing the fact that really the No. 1 criteria of site selection is public approval. And really, I think we all know by now, that we are not going to site sites really against the people if the people's will is really not to have that site there. And we certainly agree with what Dr. Chant says "we can't be voted out necessarily, we can't listen to every objector but certainly we have to have defensible arguments for putting a site in a particular location". I guess we went through the process pretty well backwards. Instead of starting with the site and then trying to justify that site to the local people, we went out in a series of public meeetings and this was through this Site Selecting Committee that we had set up . We went out to many many public meetings. I think there were over 100 in one year where it was a dialogued approach with the local communities, with groups, with concerned citizens groups. We tried to develop what their concepts of problems were, what they would like to see in the criteria that would go into selecting a site. This was done in a very general way. It was done border to border in Alberta with no particular site being singled out, with no particular area being singled out. I guess the strategy was, you know we had to try and involve all of the citizens of the Province and put forth this idea of shared responsibility. We worked through that series of meetings and finally came up with what we would feel is a defensable criteria with a list of defensable criteria and you all know what these are. You have all seen them in publications, the hydrogeological constraints, the wildlife constraints, the climate, rainfall etc. etc. We published these in quite detailed manner for each area of Alberta in fact. We spent quite a bit of time and effort and money in doing what we call a constraint mapping process of most of the areas in Alberta and really it's the only way to go. We felt that if you start singling out areas early in the game, you know, you're just going to start the opposition process early in the game. What we tried to do is in effect make sure that all areas were

covered. That any possibilities of suitable sites were not overlooked because of potential opposition or for political reasons. So we did try and cover the entire Province and this constraint mapping process is now complete. We've used the constraint maps. We've gone back to the communities with more meetings, with more explanations of the contraint mapping process which essentially eliminates areas of concern. It's done by overlaying various acetate maps over a base map and really just eliminating those areas that are of concern. You eliminate say good farm land, eliminate flood plains, you eliminate just about any of the concerns that people would bring out. And this is what we do at those meetings. We'd sit down in a local community hall with maybe 10-15 people. We'd bring out our rough copies of these maps. We'd sit down with the local people and they would tell us what the criticial areas in their jurisdiction were. We didn't come in and try and explain what they were, we asked them what they were. I think that this went a long way in getting our, getting the trust of the people in the fact that we really were sincere in a full and open program. We weren't trying to cover up things. We weren't trying to ram things down their throats. I guess the bottom line in all this is that I think we have had a few firsts in Alberta. We've had several communities actually hold local plebecites asking for the facility. And we've had overwhelming votes in two communities, one was 79% in favor and the other was 77% in favor. They've actually asked their local council to make representation to our Minister to consider their area for one of these facilities.

There is not just the idea of solving the problem for the good of the environment but also the fact that such a facility could end up costing 50 million dollars and this is quite a tax base for a small community. There is up to 60 technical and professional jobs that could be created by this facility and the necessary infrastructure of course would be a benefit to that local town. We had some failures as well. We find that sparsely populated rural areas, while they may seem ideal to planners and people in congested areas as location for these plants, we find that distances seems to change when you get out there. We have an area in south-eastern Alberta known as the special area, to most people who drive through that area, they think there can't be more than fifty people in the whole thousand square miles, but when

you call a public meeting, you get people driving 150-200-300 miles to come to these meetings and they can be very vocal about distances. To them, 10 miles is very close and it's not something where your perceptions are the same as city people where 10 miles would certainly be no problem as to having a site like this. But in areas like that and other areas in the Province, we've had a lot of public opposition and in some cases we've had plebiscites turning down the plant in those particular areas. Our Government claims that they are not bound by those plebiscites, either for or against, and I think ultimately the decision will have to be made probably by our Cabinet, you know, based on the technical aspect of the various options. But certainly plebiscites, most of the plebiscites were asked for by the local people, in fact in some cases they were forced by local option that the plebiscites be held. But I do think we have made some great strides in Alberta by working with the people in providing a full and open consultative process. I see the beginnings of that in Manitoba here and like I said before, I think you're definitely on the right track. It is a process you can't rush. It's something that has to be done one step at a time and I certainly think you have taken that first step with the symposium. Thank you very much.

Mr. Kennedy:

Thank you Mr. Ken Simpson. We will entertain questions directed to Mr. Simpson prior to coffee break. Be back in 5-10 minutes. A couple of quick announcements to make before I introduce our next speaker. I wanted to advise you that the information kits are in short supply so please keep the one that you were given when you registered. Apparently we're running low. So hang on to it. That's the blue kit. They'll be very important for the workshop discussions tomorrow. Also on the topic of workshops I will be announcing at the end of the day where the workshops on the particular subjects will be in terms of the meeting room number. They'll all be basically down this far aisle, along the Convention Centre west aisle. As well, there is going to be another new workshop that wasn't on the original list and that is the workshop on radio-active wastes. People wishing to participate in that workshop will be given a particular meeting room as well. I'll give the number out later and the coodinator for that workshop will be

Mr. Kenneth Emberley. In fact, I think at the end of the day, I will introduce all of the workshop coordinators and resource people and just have them stand up so you can have a look at them. At this time it gives me great pleasure to introduce to you Mr. John Richardson who I think will provide a very refreshing point of view on the matter of solving the hazardous waste problem. Mr. Richardson provides a private sector point of view and comes with considerable hands-on experience, hands-on knowledge, about dealing with hazardous facilities. At the present time, Mr. Richardson is the President of Chem Security Limited, that we heard about earlier as having won a major competition to provide services to the Alberta Government, on this topic. He has considerable experience in the reclamation of industrial sites, for example the C.I.L. Explosives Plant in Calgary. He's participated in assisting governments to manage a number of hazardous wastes facilities and hazardous wastes problems in his previous experience with Chem Nuclear Systems Incorporated. He was successful in obtaining government contracts to service hazardous wastes collection centres operated by the B.C. Government. He was also involved in acquiring a contract to manage the restoration of a retired explosives plant. While he was with B. Consultants, Mr. Richardson was involved in the restoration of a retired pesticide formulating plant near the Fraser River. He was also involved in the identification of the source of PCB contamination near a glass works in central B.C. In addition to that he was involved in the clean up of a pulp and paper mill's effluent also in British Columbia. He was a key member of a group that developed a PCB field test kit. He was also involved in a project to extract PCB's from mineral oils. Even earlier than that, Mr. Richardson was involved with B.C. Hydro and Power in the processing and disposal of the utility's hazardous wastes including PCB's. Other responsibilities in that particular job involved the preparation of a spill contingency plan for many oil tank storage farms owned by the utility and also the environmental security of those facilities. I'd like now to introduce a man who has a lot of practical experience in this business, Mr. John Richardson...

Mr. Richardson:

Thanks Bill. I didn't recognize the guy you were talking about there for a while. I hope I don't disappoint you. When I heard that Ken Simpson was going to be here today I suggested that rather than talk about the topic thats on your program, the proper technologies, I would follow on and fill you in as to what has happened since. The competition was held in Alberta to pick a proponent for that Province. So with that in mind, I will change my presentation very slightly and if you like call it "How We Propose to Solve the Problem of Alberta".

Last June I think it was or July, we were chosen unofficially by the Government and since then we've been talking with the Government of Alberta trying to develop a procedure and a program on how we get from the point in time of which they make the selection known and we build the facilities. There's many things that are involved and one of the most important aspects of the next step of the development of the program and the facilities in Alberta is to get a better handle on the market. What is out there? So the drift of what I'm going to be talking about initially, will be trying to explain how we will find out what the market is. In other words, what volumes and types of wastes that we'll have to deal with and then go on to show what sort of facilities we would plan to handle them. I've got some overheads that I'll use to show this and to guide me with a few notes while I'm talking. So if we could have the lights off. If I can get away without coming down there and mixing with the crowd I'll try and talk from up here where I can see my notes which will be easier than trying to fumble through from down below. This is an overview of an integrated facility. This is the solution to the problem. It's not the problem, even though it's called a wastes facility. This morning I was concerned that there may be some confusion in people's mind between what a hazardous waste site is, as discussed this morning, which is the problem, and what a hazardous waste facility is, such as this, which is the solution. In my mind, the difference is, in the first case the site was a dump which suggests was unorderly, unorganized and improper. This is a facility for managing the same wastes but in a proper, orderly and safe manner. As Dr. Chant earlier, and I recently just said, that sizing is very very important. Dr. Chant also said that what you see isn't what you get. I think he said

that and I'm going to endorse that statement based on experience that we have seen in Europe and in the United States where Reid Crowther effectively identified the waste streams and the volume of wastes that were generated in the various Provinces. That doesn't necessarily mean that those volumes and those wastes would end up with the facilities we voted. The reasons for that are, once you have built a facility and you have a priced structure in place, that industry can review and look at the economies of scale to see whether it's easier and cheaper for them to change their own systems and handle their own wastes. That has a very definite effect of the volumes that they therefore will send to a centralized facility. The 4 areas as I've indicated there, that is the impact of volume that you will see at a facility are on-site treatment by the generator, which in essence reduces the volume of the material and in many cases the type of material that is sent off to the central facility. Increasing the process efficiency at the plant also can reduce the amount of waste. On-site generator recycling is also an option that is open to a lot of generators who may not have exercised that and reclammation. There are other alternatives to that, such as larger generators may elect to build their own landfill, their own incinerator, their own deep well. So you have these 4 factors that are modifing the amount of material that ends up at your facility. Another factor that we also have to consider is that new plants that are being built exercise much greater efficiency in their process engineering and generate less waste than the older plants. For example, in Alberta, next overhead, we looked at the volumes of wastes that Reid Crowther had projected were generated in Alberta and that is the high scenario in the first column. Then we applied to that common sense, experience and a subtle factor if you like, a gut feeling as to what actually would end up at the plant, because of the factors I identified previously. Then I also, for the purpose of this presentation grouped them into the sort of treatment that was applicable for those wastes. I can't see too well from where I am, so excuse me if I get my numbers wrong. In every case, I believe there except one, the volume is reduced by up to 60 or 70% from the volume that Reid Crowther suggested was generated. We've called that the low scenario waste volume. That is because you'll see what we think will be the worse case if you like. The only volume that increases is PCB's . We think

they underestimated the amount of PCB's that will be generated on a yearly basis until they finally are totally withdrawn from service. That is the only one I believe that does in fact go up. The kinds of treatment that are identified there, starting at the top if you would Ron, I can't, we start with sludge dewatering which is a very straight forward process. Then pretreatment, treatment, filtration and deep well all of which I've grouped and called physical chemical treatment. Then there is incineration of the organics and if you look at the numbers there, you'll see they are in the majority in Alberta. Some materials are either incinerable or may be fixed and landfilled. That group I've shown as being split between the process of incineration and the process of fixation landfill. So if you go to the extreme right hand side you see that the total volume at the bottom is the same but that the majority of waste is incinerable. I have a segmented illustration of this to show you. Half of the waste in Alberta, for example according to our assessment of Reid Crowther's numbers are broken down, 52% of the wastes are incinerable, 30% are chemically treatable, 11% are fixable and landfillable and only 7% are landfillable without a need for treatment. There we are talking about things such as the residues from the incinerator for example and maybe old batteries that you can't do very much with. Why is sizing so important? Well very obviously you don't want to build a white elephant or a dinosaur. There's lot of dinosaurs languishing in Dinosaur World Park in southern, Alberta. We don't want to add another dinosaur to that pile. But the real reason is that you don't want to build a facility that's over priced. You want to build a facility that's sized to meet the market and therefore is affordable by industry. There's no point in having a cadillac system if industry can't afford it. If you penalized the industry of Alberta, for example, because of it. What I've tried to show in this table is the impact of improper sizing. If for example, we build a facility in Alberta to handle 78 thousand tonnes which equates to the 84 thousand tons, or short tons you have been referred to in the Reid Crowther report, then the prices you see that would be appropriate and would make the facility viable are the ones in the left hand column. Compare those to the current market price and you can see they're in the range or very close to the range that now prevails. If however, we build for that size and the wastes volume that

arrives at the site is 24 thousand tonnes, about a third of the highest area, you can see it very dramatically impacts the prices that would have to be charged to make the facility profitable. And that would result in a penalty to industry that would be inappropriate and it would be detrimental to the industrial base as a whole. The mid scenario is probably where we will end up, in terms of the volumes we feel any way, and you can see that the prices are still within the right ball park there. So in designing a plant, there are 4 criteria that we look at anyway. As Dr. Chant said, build small, you can always add, you can always double up. You can always run three shifts but if you've built a plant to handle 100 thousand tons a year, then you get 10 thousand tons a year, you've got a problem. More problems than simply the one of the number of hours that it's operating because you have to keep the refactory hot. The more thermo cycle the refactory goes through with a rotary kiln the sooner it wears out, the sooner you have maintain it. Its a very expensive item. Build a flexible system. A system that can be rapidly increased, rapidly duplicated. Build a modular system which ties in to being flexible. If you standardize on a reactor unit or a bulking up unit for your organic liquids and inorganic liquids and you want to double up the capacity, you add another treatment processor. You can double up very quickly if you standardize on a unit. And also constantly review your options. Reference was made earlier by Dr. Chant on some of the new technologies coming along. There are many of them and one of the dilemmas I think that we face in this industry is that we all know that a rotary kiln is by far the most flexible, versatile unit to handle just about all the problems. It'll handle PCB's, pesticides, anything. The problem is they are very expensive, very expensive. And for the majority of wastes you could probably get away without a rotary kiln. You can use a straight forward kiln with a liquid injection. And there are lots of technologies on the market now. Some of which have been developed by utilities, some of which have been developed by Good Yet, all based in many cases on a system developed at Waterloo University using sodium to destroy PCB's. That same process can be applied to other chlorinated hydrocarbons. B.C. Hydro, in fact right now, are working with Ontario Hydro to develop a system that will allow them to destroy all in-house PCB wastes using this system. That is by far cheaper than the other option to destroy

those materials in a rotary kiln. So you must constantly review your options because you may find a much more efficient and economical way to do the same thing. At the moment though, based on what we have available, the rotary kiln would be the solution. This is a plant view of the sketch of the facility that was shown on the first overhead. Maybe Rob can point out some of the main points since I can't from here. Do you want to borrow this one or can you point out. One of the first things you'll notice about the layout is it seems pretty well spread out. There is a reason for that. You want to ensure that you have good access not only for your maintenance equipment but for your emergency equipment. There is no point in having a facility that you can't get access to if there is a fire, or an emergency. It's also set out there in such a way that you could add a second incinerator or double up on the organic treatment systems without interfering with the existing operation. Coming in through the gate at the low centre there, you would first approach the guard and the laboratory. As Dr. Chant said, any loads that come through the gates must be analyzed and if there are any doubts as to whether the load complies with the Manifest, the truck would go into a quarantine area until the matter was sorted out. Also, besides the laboratory and the guard house there is the administrative building and an area for visitors. Strangely enough, facilities such as these get as many visitors as the Legislative Buildings. There is no similarity in the procedures though. As we go into the facility the main building there comprises initially the inorganic treatment area with reactors and storage tanks etc. Farther on we get into the area where you see higher the organic storage and bulking tanks and day tanks and to the right of that, the incinerator. I've got a better view, plant views of incinerator. I'll show it later. To the left you see a lagoon. The lagoon is where water from the truck decontamination area is collected and evaporated and if there is a deep well available and on that particular plant view we show a deep well although it is by no means certain there will be one. The water would be ponded and then sampled to make sure its safe to deep well inject and then we deep well inject. Not showing, in the plant to the left there is a road going off into the bush where the landfill would be located for the residuals from the chemical treatment and the incinerator. I think we're too big for the screen. What I intend to show here is the route by which different types of

materials go through the system and end up either as liquid wastes for the deep well injection process waste water or in the landfill as a residual from one of the operations. I've broken them down such that you can see most materials go through either incineration, with the exception of some of those that are organic that could be recycled; treatment which means to be detoxified, changed the chemical formation by the addition of some other chemicals; to pretreatment, one of which will be de-emulsification, separating an oil so that you can incinerate the oil and just dispose of the water. And on the extreme left hand side if you move it Ron, through filtration. Some material merely requires filtration. After treatment many of the materials that you'll derive from that process, the sludges and the precipitants will require additional treatment of some sort, which in most cases it will be called fixation. It's a process by which you take a sludge or a precipitant and by the addition of chemicals and maybe cement you make it, transform it into a much more less mobile form than the original waste. The chances of leachates being generated by it are far less and thne of course the materials go to the landfill. The residual from the incinerator, which will be clinker and slag, so will be flue, the precipitants from the incinerator flue and various filtration sludges that are safe enough to be transported to the landfill. We have a problem. This is a very one line diagram, if you like, sort of routes by which some of the material we've talked about will go through the facility. You have both liquids coming in that would go through day tanks into blending tanks. This is the inorganic treatment, the inorganic materials, materials that will not be incinerated. The reaction tanks are where you detoxify them, precipitate the sludges, whatever. From that it will go through a filter to separate out the supernatant, the water if you like, water from the sludges you've generated. That water goes down to deep well after it has been analyzed to make sure that it's safe to do that. The sludges from the clarifier goes down to the sludge pits as do sludges that are generated from the reaction tank and possibly some materials that are suitable to go straight in for fixing. I haven't finished Ron. Can you move it to the right? Drums are another way by which materials comes into the site. The only other stage that is added in the process is the drums must be emptied of course and they would go up to the day tanks through the blending etc. From

the sludge pits, materials go to the belt press. The purpose of the belt press is to take as much excess water out of the sludges as you can before you either put it into bins for landfilling if its inocuous enough or to fixation if you think that extra step is necessary. Okay. I'm just going to point out the cylium part of the incinerator. Starting on the left hand side and ending on the right, which is the flow route the materials progress through. On the left hand side you have the feed system, the chutes, the hoists and into that the rotary kiln. The rotary kiln portion is where Ron is pointing out now. You can put drums, you can put sludges, you can put solid matter, you can put liquids. The secret of the rotary kiln is the amount of time that material stands in the kiln that will allow for total destruction of particularly things like PCB's. PVC's require a longer incineration time than the majority of organic materials such as oils and solvents. The large square building, as it says, is the secondary combustion chamber, out through a boiler by which means we extract some energy from this whole process. That energy can be used in the form of steam which is generated to heat the area or generate electricity which is done in some of the European facilities. Then we go through the spray dryer, down through the flue gas and through the various pollution control devices that extract the precipitants, the particulates and some of the acitic gases if there are any. That is a very basic quick run through, but I think for the purposes of today's meeting that is probably appropriate. We talked about deep well. Deep well is a technique that is used very extensively in Alberta so you get rid of all field wastes from the drilling operations and in particular, I think, a lot of brine which actually comes from oil generation. Some of the fields have a lot of brine on top of them which is taken out first, now is put back in. A lot of salty solutions goes down there. Basically you are using the underground caverns, in many cases that have held oil in the past, as a long term storage for waste water that is in particular a salty solution that is fairly inocuous enough and compatible to what was there before. There is nothing very complicated about a deep well in that respect. We were talking about secure landfills this morning and some opinions were made regarding them. This is a landfill trench as opposed to a secure landfill which is a statement of the capability of the area to support such a trench. The residuals are placed, as you can see the

various components, you have to have access to the trench, down the ramp. The floor of the trench is lined with a material that will allow for the collection of any precipitate from any leachate that finds its way down through the lining material. Of course if you're only putting dry materials in there, there's very little chance that you'll get any leachate. The only force that would drive would be precipitation and in the type of landfills and trenches that I've been involved with, that precipitate is removed before there is any chance of combining with the materials deposited in the trench. I've got some slides that I'll show later of typical trenches. In some cases, in addition to the liner that is shown there, you have the natural protection of the local environment. By that I mean the soil geology is such that you have a built-in integrity that the liner is only adding to. Ken referred to that earlier. In Alberta they searched for areas that are suitable and give you that additional degree of protection to this, that is desirable. For the purpose of this meeting I thought it would be interesting to look at the Manitoba waste inventory and see how it performs or compares with the Albertan one and in fact see how our assessment compares with Reid and Crowthers. People have been talking today of about 40 thousand tons a year. Remember these are all in tonnes, the numbers in here so you multiply by 1.12 I think. Can you move it slightly upwards? I want to show the totals. 36 thousand tonnes which equates to around 40 thousand tons. We have ended up with 14 thousand tons that we think we would end up with if a facility was built for the reasons that we've described earlier. People will find new ways of reducing the amount of wastes they generate. Also you must realize, that for example, if you look at organic waste 8 down from the top where we show 9 thousand tons have been generated. A lot of that is simply water and before you would move that from the facility which is generated you would obviously remove all of the water. There's no point in shipping thousands of gallons, thousand of tons of water all over the Province. So that number was dramatically reduced, as you can see, to less than a third of the original value. Industry in Manitoba on the whole, would tend to be older than the industries in Alberta and therefore we did not reduce the volumes to the same level as we did in Alberta. I think there was a 50%-60% reduction in the volume of wastes here, as opposed to Alberta reduced by 60-70%. But again no

surprises, you have the largest volume of material that is suitable for incineration. For the last segment it's you again almost 68%. Much more so than in Alberta, based on Reid and Crowther's numbers, will be suitable for incineration. 15% for physical chemical treatment and 17% for fixation and landfill. I did a similar exercise with Saskatchewan and in Saskatchewan, based on the same sort of assessment, we ended up with 72% of the materials generated there as being incinerable or organic in nature. All the way through the previous presentations the theme of public involvement has been raised. I endorse all of the things that have been said earlier. To date the Alberta Environment and the Government Consultants have done a large task in the public participation program. They embarked upon it and have been successful at it. And we will plan to conduct their own program which will dovetail into the Government's at some future date in the same manner of openess, because it is true that you may find a site that is acceptable and you can convince the public that it's going to be safe, but you have to maintain that confidence of the public and the only way you can maintain the public's confidence is to be open with them and to have them involved. Ken referred, I think earlier, to a public advisory committee or he called them monitoring committees. We are going to ensure, ourselves, that that acceptance is continued and that our relationship with the house community, wherever they may be, will be exceptional. We'll do that by three ways. We'll be employing local people and very quickly if something at the site is not copacetic or not thought to be quite safe, if the local community is employed at the site, right away they know exactly what is going on and will bring it to the advisory committee's attention, to the Manager's attention and it will get immediate attention. The second route is by running an open facility, one in which you're welcome to come and look around and nose around, if that's the right expression, given certain contraints, such as we don't want you walking off in the incinerator without someone being with you. The third method or the third reason by which we could hope to ensure a successful operation, is through the use of public involvement, through advisory committees, and also through having on that advisory committee, not just the formal representatives of the community, we must also have the informal leaders. This is one of the things that the Albertans have done very successfully, ensuring that not only

have they kept the political leaders and the formal leaders of the communities involved and informed, but also the informed leaders who often have much more clout. Where, I'm sure are you asking, has this happened? Has this ever been achieved, this open communication and this successful operation? Well it has. There is a facility in Oregon, and we're blowing our own trumpet a little bit because we own the facility, where we think this has been shown to actually be a success. I'm now going to show some slides of that facility where, right now if you wish, you could arrange and go and meet with any of the community leaders, any of the community members, and ask them how they feel about having a hazardous waste treatment facility in their back door. And you'll find half of the people won't know what you're talking about because it's not such an issue any more. They feel as comfortable with it as they will with a gas station. There are, of course, people who don't want it. But they are going to be there no matter where you go. The main thing is that the majority of people are happy with it and the concerns and the fears they may have had earlier on have evaporated because of the use of the techniques we've just described. Open operation, public involvement in not only advisory committees but also in the operation of the plant. So if you'll, first slide. Move on to next one. Oh I got hit. Maybe we could shut off more lights so we can see clearer. The facility is in Oregon and if you know much about the Western States, Oregon is probably one of those environmently conscious states in the nation. So to have a facility first of all sited there and operate successfully is quite an achievement. The site is just south of the Columbia River about 140 miles east of Portland. It's actually right on the old Oregon Trail where the old wagoneers came out to settle the West. This is the Town of Arlington from which the site takes its name. The bins in the foreground are grain silos. That's the Columbia River and that's the main highway bridging that small embayed area. The Town has a population of about 600 I believe. It's a typical rural community. There is lot of farming going on, grow winter wheats, some cattle ranching and the facility is about 14 miles south west of the Town. You can see the area is pretty arid. The whole area has a net evaporation rate of something like 30-40 inches a year. So there is no chance of any leachate being generated by precipitation. That's an aerial view of the facility. You're not going to

see here because it is not an integrated facility, unlike the one that is being proposed for Alberta. Because in the States it's totally free enterprise, there are facilities that will handle for example: incinerables, facilities that will handle recycleable materials, other facilities that will do physical chemical treatment and fixation and landfill. This facility is one of those. The operations there are: chemical treatment, fixation and landfill. They also act as a staging area for other materials that are sent elsewhere for incineration such as PCB's. The interesting thing about the slide is, like I said, the people will view the facility with no more concern than a gas station, the circles on the right are actually irrigation circles where the local farmers are growing, I think it's kale to feed their cattle. As I said, on the site the processes do not include incineration but we include all of the other processes that would be seen at an integrated facility. Disposal, which is the bottom line, is what you do with what you end up with after you treated it, or fixed it or whatever. Sometimes that material comes in the form of containers down there from, for example incinerators from other treatment centres. Other times it comes in the form of bulk material. You must understand that the laws in the U.S. are slightly different to the proposed laws in Canada. In the United States they are allowed to landfill contaminated materials such as soils and some process wastes. In this particular facility, because its considered by the EPA anyway, very secure landfill. Very secure. I didn't bring slides as to why it is secure but I can assure you that there is something like 500 feet of basalt that is not fractured and clay and conglomerates between the facility and any aquifer. The secure landfill, it looks like this, a trench, as I talked of earlier, is a hole in the ground, but it's a very special one. On the slide you can't see too clearly but there are what are called french drains coming on the left hand side that allow you to sample any leachate collection beneath that liner that you see there, the base material. These trenches are not lined by the way. There is no need for it in this particular facility. That is, container wastes that come in the form that you see there can be directly placed in the landfill. And just like the regular municipal landfill at the end of the day they are covered. They're laid in a manner that the location of any particular waste is identified very closely and I'll

show you later how they do that. That's bulk waste. That came from Calgary. We heard about the reclamation or the clean up of an old explosives plant that was in Calgary and the material you're seeing there is soil, good Albertan soil that actually contains any of 1 part per million of mercury. Correct me if I'm wrong Ron, a very low level. There is not very much you can do with that material. The reason that it was moved out was that the site had to be restored to background levels because it was planned for an urban area so the arrangement was to clean it, take it back to its original form. Records. A trench actually looks like that to the record keeper. Anywhere in that grid can be identified by a series of coordinates; for example: this slide tells me that the materials that I've identified are from C.I.L. on the lower left, C.I.L. is the generator, the sign on the top there's a load number, below that is the date the material arrived and there's a, I can't read half of it. Coming down you can see the generator number, the customer number, the initials of the person who is responsible for in this case GSR, its me, and identity of the person who is hauling it, the hazardous waste number of that transporter and there its H-51. They are all registered in the U.S. The transportation type, bulk dump truck and then underneath that the waste information, the volume, the cubic footage, the description of what it is, mercuric waste and on and on and on. On the right hand side you see the location of it in the trench by first of all T4, Trench 4. Can you focus that from over there, I can't read the slide information. Its got the date it went in the trench. It's got a process number and 2 simply means its bulk. The section of the trench, Section 15 and the Depth, was Depth Y. With that information you can go and pull that stuff out of the trench because you know exactly where it is. One of the advantages of that system is that if you do have a material you do want to store for future reclamation, you know exactly where you've put it. Also it is the way by which if you do, heaven forbid, find some leachate at the bottom of the trench after the trench has been sealed, you can analyze the leachate for chemicals and pretty well identify what is causing the leachate and go straight to the source of the problem because you punch in the information into the computer it will reel back to you what was placed in the trench of that type that's showing up in the leachate and you can identify the location from the record. This is just a

monthly print out that they get and send off to the Ministry of Wildlife Quality Control in Oregon of what's gone in for the last month. Processing, we have talked of incapsulation. Sometimes that's the only way and it is allowed in the U.S. Land and bio farming is practiced quite widespread right now here in the West by the petroleum companies to get rid of all their wastes. Solidification is mainly immobilizing a liquid waste by adding absorbent material to it. This was waste from British Columbia and it was sodium cyanide that had been involved in a motor vehicle accident. All the sodium cyanide from the accident spill that was reclaimable was taken by the company who owned it. The material that was left was basically soil, contaminated with sodium cyanide. The soil was packed into steel coffins at the site of the accident, shipped down to the facility, placed in one of the secure trenches and then forned into place around and the whole thing was encased in concrete. Then given this is a very dry part of the world, you've got about a foot and a half to 2 feet of concrete around it, you've got 1/2 inch of steel, then you've got soil contaminated with sodium cyanide. I think that maybe this is an acceptable way of getting rid of that particular waste. Dr. Epstein may disagree. That's what you end up with, a coffin. Appropriate. Land farming, as I say, is practised widely by the petroleum companies that comprises the spreading out on the land of a layer of oily waste, adding some nutrient to it, uria or something like that by nature, and then keeping it moist and constantly turning it over to let the air at it and the bugs that are naturally occuring in the soil biodegrade the oil at a very rapid rate as compared to how it would degrade normally. You all know that if you oil a road, the oil goes away after a few months. It degrades, well part of it degrades. This is the equipment you would use for that biofarm. This was an experimental one that would be enlarged if you got into business seriously. There's the irrigation system and you can tell on that picture that grass is starting to grow back where the biofarm activity took place. That's the grass growing, that's after six weeks you're back to basic state. Over a period of time say, the oily wastes you've applied to that contained high levels of heavy metals. Eventually you would remove that soil because it would be contaminated with heavy metals and placed in a secure landfill trench. Reclamation. Dr. Epstein talked about above-ground storage. The

concept employed in Oregon is below ground storage in a trench. This trench is dedicated to material that is generated by the aluminum industry, pot liners. It contains a very exotic element, cryolite. But in the process of making aluminum, the cyanides are generated in the process and the material, the pot liners, become saturated with cyanides. That is why it has to be held in a secure storage. Eventually, when enough material has been collected, the plant has to recover the cryolite. That's the material in question.
Treatment. There are two types of treatments. One is very basic, the other is a little more sophisticated. Soil evaporation pond, as I said there's about 30-40 inches of net evaporation a year in this area, so if you took some wastes that otherwise you would have to dewater and put into a pond, you've evaporated off the water at no cost to you. The good old sun provides the energy. The ponds used for this operation are purely for aqueous wastes. No toxic wastes, no odorous wastes and no highly volatile wastes can be treated this way, just aqueous wastes. The pond is made simply by making a depression in the ground, beneath the line of that, I haven't shown it, is a network of collectors, again to collect any leachate that might occur or rupture the liner there or the soil that's placed on top. Here's a finished pond. The material is pumped into the area over the spring months. If you can see that, it's full. Over the summer it dries out and you end up with a very very thin layer of a sludge or precipitant that's derived from the drying out of the original material. That may be treated, it may be slightly caustic, it may be slightly acidic. So in many cases that is fixed by the addition of chemicals to neutralize it and then stabilize it before it goes into a landfill. This is a little more sophisticated. As I've explained you are not going to see a big factory, it's almost like a farm yard out there. At the top you have the bulking tanks. Each tank would be set aside for a particular type of waste, a caustic, a toxic, organic, whatever. That is fed by gravity in this case down to a reactor. In the reactor you detoxify, or you would neutralize, whatever particular process is suitable for the waste stream. If it was acrious, you would send it off to the ponds, again as your very energy effective way of drawing out your acrious wastes. If it was organic, it would be sent to the biofarm or in some cases sent of for incineration if it was appropriate. As I said, there is no incinerator at this facility. As you can see, the flags on

the ponds reflect the fact that there's no sense of, there's no evidence of odours. The birds are quite happy to land on the ponds. We just don't like it. We try to keep them off with the flags. The whole area is full of, I'm not sure what they call them, but they are rather like small pheasants, all over this area. They were introduced from South Carolina by one of the operators. They are not indigenous to the area but they thrive there, and they are very tasty. That's another view of the reactor. One of the reasons why they can operate in this way down there, is it's so dry and there's not much rain. We couldn't do that in sunny B.C. it would be rusted in very short order. Solidification. As I said, in the States they allow certain treatments that at the moment are foreseen here and that would be where you take an organic waste that you can solidify by the addition of some absorbent material. You could use vermiculite, you could use soil, as I think is used in this case, and you manufacture a granular material that essentially immobilizes the waste. And again, given some very arid area, there is no driving force to drive anything out of that material. And this is the sort of material that we end up with. It looks rather like slag from an incinerator, it has the same consistency. Chemical Fixation. We talked about this earlier. It is when you change the chemical nature of the material. First of all you have to decide which chemical compound and whether in fact, concrete, cement rather, is the appropriate medium to use to bind the material together. As I say, you can use various things. Sometimes, if you experiment with naturally occurring substances, such as this material here, it is puzzling. It's a natural occurring type of material, very similar to cement. We experimented with that and also cement. And again you end up with rather like a pavement type material that does not leach. As I said, they don't incinerate materials there. But they do act as a staging area; for example PCB transformers are shipped there. At the site, the transformers are drained of their PCB fluid, then flushed according to EPA standards. The liquids are sent for incineration. In the States the transformer body is considered to have been relieved of any PCB's that could possibly be leached from it and therefore it's safe to landfill. I don't know what the Government regulations will be in Canada. I suspect similar but I don't know. In fact they are under review right now. That's just the drums of material that are derived

from the flushing operation. One of the things that we have started to do, because we see that there is a need for it, and it also is most cost effective, there are many industries that generate large volumes of acrious wastes and as I said earlier it's pointless shipping thousands of gallons of water hundreds of miles. It makes sense to try to reduce the volume at the generator's site and this was an experiment we conducted, actually with the military in Victoria. When we went over to process it was a metal, a metal finishing shop waste from one of their maintenance locations on Esquimault and we, I think the next one shows, we started with the material on the right which was full of contaminants and by the time we processed it, by the addition of chemicals, and by the passing of it over a belt filter to remove the precipitant, or the flock lint in this case, we ended up with clear water. So we simply took the cake, this material, and volume reduction in the order of 1-50. It didn't cost anything to them and of course we profited from providing the service. There are other treatment systems. These are some slides that are not equipment that we own but it shows you how sophisticated and complicated these systems can become. This is a view of one of the installations. An incinerator. This is the company that we included in our team when we bid on the proposal to provide the facilities for Alberta. I think one of the latest speakers will probably talk more of the European experiences, of which this is one. This is the drum handling portion of the facility for materials that come, inorganic and organic wastes in drum form. Those drums will be processed by bulking up into the day tanks and the storage tanks before processing in bulk. That is the bulk storage tanks for I think this is organic, I'm not sure. This is the other area where sludges are dumped into a sludge pit. In that previous very simplistic outline we showed a pit into which sludges came from the physical chemical treatment processes and in some cases directly from the generators. That's a sludge pit, that's the bulk. The rotary kiln, which is a sort of the centre-piece of the incinerator, is the rotating oven, if you like, where the wastes that are to be incinerated start their journey through the system. The diameter of that would be in the order of 4-6 feet depending on the size of the facility. There is the inside of the rotary kiln, it's lined with refactory bricks. I think we're looking directly at the flame there. We're on the down side of

the rotary kiln. And that's all the slides I have. I hope they were of some use. Thank you very much.

Mr. Kennedy:

Thank you John. We will receive a few short questions.

The Floor:

How wide of an area does that plant in Oregon serve?

Mr. Richardson:

It would be, if Reid and Crowther is correct, it will be a lot less than for example Alberta. It would be 1/4 of the size of volume of waste of Alberta. You really have to think in terms of the amount of waste that goes in the plant. If that plant, for example, receives the volume that's projected by Reid and Crowther as being generated in Alberta, it would probably include an incinerator because it would be economic to do that then.

The Floor:

Yes, I was just wondering if you could tell us how many people you expect to employ in this facility and you're going to need people who are highly trained. A lot of expertise. Are these people available? Are they available in Canada, are they trained here? What type of training would they have? And the other question is you also said that you thought you would want to hire local people and what type of training would those individuals have?

Mr. Richardson:

Okay. The facility itself, apart from the administrative officers that you probably need in various cities, could require 50-55 people. Of that 55 people, you would probably have in the neighbourhood of 60% that would be people who are actually involved in the processing and handling. The rest would be administrative or laboratory. As far as using local people, in the past where there has not been people locally available, we've attempted to initiate training programs. Before the plant is built, we will know what we are building and we also have the services and access to the facilities of

many other plants owned and operated by ourselves and by others. Actually, Vunral built, doesn't operate the plants. But they have access to plants where we can send people to train them, before we need to have them running the facilities. That's how we would approach it. We would try to use, as much as possible, people from the local community. One of the sad things about coming from a rural community and I do, is that it's very rare, if you want to pursue a technical career that you're going to find anything locally. You usually have to leave home, move away. With a facility like this, it is quite possible for young people to pursue that career without having to move to the big city. It also gives access to much larger organizations within which to expand their career if they wish to.

The Floor:

What type of training would those people actually get? Over what period of time and what types of courses? Who will be giving the course?

Mr. Richardson:

We haven't got that far down the road. You know we haven't finished our markers to the end, and we haven't signed our contract with the Government. You're talking about maybe a year, two years down the road and until we fully identify what the facility will comprise in total it's hard for me to answer that question. But the sort of job, is that what you're asking, that those people could do? What sort of jobs they would be trained for?

The Floor:

Well it's just that sometimes people are handling materials that they are not familiar with and they don't realize themselves how dangerous they are. And if they do become contaminated, sometimes steps should be taken immediately and if people don't know, then they're in a risk situation. So I think that the people who are just doing the routine handling should have very solid basic information on these types of things. And that leaves me, Sorry go on.

Mr. Richardson:

Yes, I was just going to say I agree, you're right. No disagreement. In the facility we showed you, they have weekly safety meetings and training sessions and its an ongoing thing. It's not as if you have a training session for a group and that's it, until you replace them. Every week there is some new aspect looked at and there is a whole group of people whose sole job is to make sure of safe operation, quality control, quality assurance. You have a laboratory that checks out everything that comes in. Before it is handed over to the people who are the operators, it has to be confirmed that the material has arrived, in fact, is the material that was supposedly sent. As Dr. Chant said you've got to make sure of what you're handling.

The Floor:

Where do you expect to recruit your top experts from?

Mr. Richardson:

Alberta.

The Floor:

Does this mean they are going to be a PhD with experience? What type of background?

Mr. Richardson:

The most technical job in the facility would be the fellow who runs the laboratory, who would be making decisions on treatment. Over and above that, 2 or 3 skilled people would be responsible for operating the incinerator, which is very complicated piece of equipment. And the person operating the physical chemical treatment plant. They will be chemical engineers, maybe several engineers for the incinerator and beneath them you'd have technicians to do the physical, or the laying on hands if you like.

The Floor:

One more question. What type of arrangements do you propose to assess the health of the people in this facility?

Mr. Richardson:

There is a three prong or three phase program. Before someone is hired they undergo a complete physical to give us a base line data from which to monitor any adverse things that may occur. During the course of employment on regular intervals, monthly or bimonthly, I'm not sure exactly, the person is given a check-up. That will include, if it's felt necessary, blood work which would show any contamination from association with the actions on site. But given that where in a normal industrial plant the wastes are not handled as a commodity, it's a dam nuisance when they get rid of it. It's not given the attention that we would give it because it's our livelihood, so our approach to the problem is a lot more cautious if you like, a lot more concern. This is our livelihood. You want to stay in the business and to do that you have to run an operation that is safe and efficient and to do that we must keep the people we have, we don't want to lose them. If we don't insure they're protected, we'll lose them so we make sure they're protected. And the record of the facility down there, I keep going back to it, they have not had any problems of a medical nature to my knowledge in 7 years. But the people who work in the facility are the biggest watch dogs you know, they work there, they watch out for themselves. Which is great.

Mr. Emberley:

Mr. Richardson, the facilities in Oregon and in Washington are you at all familiar with both of them.

Mr. Richardson:

No, I'm only familiar with the Oregon one.

Mr. Emberley:

You're not familiar with the one in Washington? I was wondering if you happen to know if there was a major difference in the type of facilities for handling low level radio-active wastes and conventional hazardous wastes.

Mr. Richardson:

I have been to a facility in South Carolina that was a low level radio active waste disposal facility and basically the special thing about that was the incredible security and the incredible monitoring of the people and vehicle and activities to ensure that no one was exposed to any level of radiation over and above that which is considered safe. It's incredible security. The operation is basically the secure burial of low level radio active waste and in many cases that's clothing that people have worn around reactors, soil maybe that was considered appropriately buried and containers that contained filters that were used to filter water that's used in the cooling processes and reactors and things like that.

Mr. Emberley:

Might hospital wastes, mildly radio-active wastes from hospitals be included in there?

Mr. Richardson:

That could have been. I can't say for sure because I don't know, but it would be that sort of thing that would go in there.

Mr. Emberley:

The basic site was not a great deal different from a conventional hazardous waste disposal secure disposal site?

Mr. Richardson:

Except the approach.

Mr. Emberley:

The security. Thank you very much Sir.

The Floor:

I'd like to ask if you have an open evaporation system and the liquid is being sucked up in cloud formation, is it going to create a problem like acid rain when that cloud formation comes up?

Mr. Richardson;

No because the water evaporates and leaves behind the salts or whatever is in the water. The salts don't evaporate. I mean you saw the irrigation circle right up to the fence. There's cattle grazing there and I'm sure if we had a problem or they had a problem with that it would be evident. There is monitoring conducted around the site too to ensure that there is nothing leaving the site because of being airborne.

The Floor:

There is just one other question. I noticed that the site was on a hill.

Mr. Richardson:

Its on a plateau actually.

The Floor:

Why do you put it on a hill? Was it the only suitable material site?

Mr. Richardson:

No, no. I wish I had brought more slides just to show you. It's very interesting. The Oregon Trail runs right through there and the Oregon Trail is actually in the valley of an old dried out creek. That is not wide enough to put the facility on so we go on the bluff. You've got, first of all, a greater depth of material but also you're out of the way of all the traffic and you've got room to expand if you want to. It was purely a practical consideration. You didn't want to stick it in the middle of the railway track or the road which is down below.

The Floor:

Thank you.

Mr. Kennedy:

Thank you very much Mr. Richardson for your very informative and very practical illustration of things that work elsewhere. At this time I

would like to introduce the last speaker for this afternoon's presentations. A speaker who has come the furthest; from Berlin, West Germany, Mr. Axel Szelinski. Mr. Szelinski has done legal studies in both Berlin and London. He also has done some studies at the London School of Economics. He is a lawyer by trade. We've heard from medical doctors today, from epidemiologists, from PhD's and engineers, now we have a lawyer. Since 1974, Mr. Szelinski has been working with the German Federal Environmental Agency and since 1980 has been working with the Ministry of the Interior. In the Agency itself, he is responsible for waste and waste management activities including legal affairs of that particular branch, including hazardous wastes management, also dumping at sea. In his spare time Mr. Szelinski is also a lecturer of Environmental Law at the Berlin Technical University. I'd like now to introduce you to Mr. Axel Szelinski.

Mr. Szelinski:

Thank you very much for your welcome Mr. Chairman. Before I start I was asked by Dr. Boldeck, who was already in the schedule, that he regrets very much not to be able to participate due to the early elections in Germany. Well, he just could not get away. So I will have to take his part here and I myself am very happy to have got the opportunity to tell you something about the European experience. Before I start, I would like to congratulate the Manitoba Environmental Council to hold such a meeting before decisions in the field of hazardous wastes management are taken. Not only because it gave me the chance to be here, which I enjoy, but also to meet the quite obvious public interest in getting information and opinions on the issue. I have to apologize for using my notes but I'm not a native English speaker and I can't do without some paper to look at. I would like to comment briefly on two issues which has been discussed today. First of all, I want to add a brief comment on the presentation of Dr. Epstein this morning. Although I enjoyed very much listening to him, I found some of his proposals rather scary. I quite agree to the basic conclusions he gave you. The only objection I have to make is that I have severe doubts that the brave new world he tries to describe, that is the waste or non waste technology will develop quickly and will bring fast solutions of hazardous wastes management

problems. I just want to mention a few facts. If it is said that you can probably destroy about 80% of hazardous wastes through incineration or pretreatment, these figures meet the experience in practise but what to do with the remaining 20%? Whatever you burn, the ashes remain. If you calculate the current hazardous wastes arising in the U.S.A. you will have to deal with about 7 million tons per annum of ashes and of wastes that have past pretreatment. And I doubt very much that you can just store such amount of wastes in, well, concrete bunkers, as he puts it. And by the way, to which purpose? What I mean to say is, that in my opinion, landfilling will be indispensible for the decades to come. And there is another point that I want to comment on. There's a great danger, in my opinion, to paint future developments in waste management options in brilliant colours. The public might be convinced that it would be sufficient to wait a while and the solution to the problem will turn up automatically, like some kind of magic. There is, in my opinion, not the slightest chance that this will happen. In short, backing new technology and backing coming technological developments does not hazardous waste disposal including landfill superfluous. The task to find management solution has to be fulfilled now, whatever the perspective, for the future may be however optimistic you look into the future. I will now come to the issue I was asked to talk about. And it is not quite simple for me to give a presentation on the European experience with regard to hazardous waste management, particularly as such a presentation should aim to point out experiences which could be taken as guidance for a country like Canada or even for a province like Manitoba. Europe and the New World are very different, not only with regard to geography, density of population, and environmental needs. Besides this I have my doubts that a common European experience in hazardous waste management exists at all. There are, in fact, very different experiences and approaches in the different countries of Western Europe. As far as my knowledge goes, there are none to be reported of Eastern or Southern Europe. There was one fact that struck me during today's presentation. I was quite surprised that only some 45 thousand metric tons of hazardous wastes will rise annually in the Province of Manitoba. If you compare this amount to wastes arising in Western European States it seems to be a ridiculously small amount. Western Germany alone generates about 3.5 million tons of hazardous

wastes annually. France about 2 million tons. Great Britain 3 million tons. All countries which size is comparable to the Province. Even a small country like the Netherlands, which might just fill the city limits of Winnipeg, produces about 1/2 million ton of hazardous wastes per year. So in my opinion, 45 thousand tons per annum could be easily disposed of in one simple, small to medium size facility. In my view, your problem would basically be an organizational one. These figures, of course, do not prove anything and I definitely do not want to be misunderstood. The comparatively small amount of hazardous wastes does not mean that the public should neglect it. The risks involved in improper hazardous waste management are not essentially a function of amounts generated. Small amounts, if not disposed of according to the state of the art, can produce high risks and high costs together with severe pollution. What I meant to say is that with some good will from all interested groups it should be possible to find a solution even within reasonable time. In my review of the European experience I will have to try to point out basic principals which might be part of the common European experience in the field of hazardous waste management. An experience that is strongly influenced by comparable cultural, social, economic and political background of the different states in question. This remark is not meant to avoid the presentation on the wanted topic but I think it is necessary to eliminate the idea that Western Europe, small in comparison to Canada, has already achieved the goal of uniform practise with regard to environmental protection. There is however a good deal of cooperation and coordination between the Western European States within international or supernational organizations which aim at common policies and it is acceptable to say that there is a number of commonly agreed principles. I will try to describe these principles. The last decade has been an extremely fruitful one with regard to hazardous waste management in the Western European countries. Most States have worked on hazardous waste management programs and legislation. In 1978, the European community has issued a directive on toxic and other hazardous wastes as a supplement to the directive on wastes of 1975. The principles laid down in these directives are binding for all member States and will step by step lead to a uniform practise in waste management. These directives however, can only be regarded as a platform on which differences as result of

national peculiarities still occur. The directive on toxic and other hazardous wastes does require inter area hazardous waste definitions, planning principles, licensing patterns for hazardous waste facilities and control measures including trip ticket procedures for hazardous waste transportation in accordance with the principles of the directive within the member States of the community, in some States even before the directives have been issued, for industrial wastes or special wastes. The term special wastes describes a group of wastes that need special treatment or special disposal practices as compared with domestic refuse or household wastes. For this group of wastes, special legal requirements apply in the different countries which can be summarized as follows: There are definitions on what is a hazardous waste. There are hazardous wastes lists. There are special control mechanisms regulating waste generation, waste transportation, waste disposal facilities including facilities for storage of waste. There is waste stream control through accompanying documents or trip ticket procedures. There are licensing procedures for waste disposal facilities, sometimes even including waste generation. Apart from a legislative control of special wastes, the political principles which govern generation and disposal of such wastes of prime importance, there is general political agreement on the principles that should apply for waste disposal policy in general and on hazardous waste management policy in particular. The generation of waste should be reduced to the minimum, taking into consideration feasibility and economical aspects. Wastes should be recycled or reused unless it is economically unreasonable. Only waste that cannot be avoided nor used with reasonable costs shall be disposed of in an environmentally sound way, that is, avoiding as far as possible any damage to the environment. Finally, where a disposal of raw waste may constitute a problem with regard to the environment, which can be avoided using pretreatment options, these options should be used. There is, although there are these common principles, a lot of points still under discussion in Europe. One current subject is the discussion on the right way of how to define hazardous wastes. This discussion is as old as it has been fruitless. Basically it requires an answer to the question on the best practical approach. It has to be said that either science and industries tend to put high demand on the definition issue requesting scientifically acceptable

methods. I would not like to discuss whether it is possible or not to meet these demands. I would just like to ask the question whether it is reasonable in terms of practicality. The more sophisticated a definition is, the higher are the administrative burdens for the responsible authorities as well as for waste generating and waste disposal industries. Currently there are three different approaches towards the classification of hazardous wastes in Europe. First, a pragmatic solution. Trying to describe a waste in a qualitative way indicating type, origin and constituents of the waste in regard to its hazards. The second approach is a more scientific one. It tries to define a hazardous waste by certain characteristics generally involving standard testing procedures. The third way is to describe hazards in association with concentration limits of harmful substances. In this case the presence of certain amounts of listed hazardous components makes a waste a hazardous one. All three approaches have their value and can be justified. The first one has the advantage to be easily administered and enforced without too much testing and laboratory expenses. Additionally it has the advantage to be quite flexible and allows qualitative rather than scientific judgments. The other two methods of defining hazardous wastes present scientific and clear descriptions of waste, theoretically leaving no doubt for waste generators and disposors in the field of classification. They imply however, a tight control and surveillance of the parameters which in practise may pose problems with respect to limited manpower, both for waste generators and for control authorities and may therefore create problems of enforcement. The experience in Europe shows that the definition is only of limited importance with regard to the effectiveness of a management system. It does not help to spend too much of sophisticated thoughts on how to define a waste if there are no means available to dispose of it properly. The establishment of hazardous waste disposal facilities, particularly in Europe, is a very difficult issue with regard to many questions about responsibility. The question is, who is responsible for the establishment of waste disposal facilities? The waste generator, private industry or the public in general? The question of financing such facilities is a very difficult one and has found different solutions in different European States and even in different Federal States in Germany. It is a question of who is going to carry the financial burden with

respect to investments for facilities and for the current costs for facilities. Another issue is the planning issue. Is there at all a need for planning? Who is responsible for it? What are the planning principles, centralization, decentralization, on site treatment and the question, how are the plants to be enforced. A still critical issue is the issue of public acceptance with regard to hazardous waste disposal facilities and if I recall it right, one of the previous speakers said he would expect a facility, well, he would expect that it takes 5 or 6 years for a facility to really be built and get into operation. That is an experience that is true for Europe for a long time already. We would be happy to get the facility built within a timeframe of 6 years. Basically due to problems of public acceptance. Everybody tends to agree that hazardous waste disposal is not a job for governments or other public bodies. The only prime responsibility of governments in this field seems to be the enactment of legislation and its enforcement and the implementation and the execution of control.

However, even the establishment of hazardous waste disposal facilities can become a field which need government involvement, either with regard to financing or even to supplying facilities established, maintained and operated by public bodies where private initiative proves insufficient. None of the European countries so far has made the establishment of a comprehensive waste disposal system for special wastes a government obligation. I mean by law. Some States explicitly avoid government involvement in the build-up of disposal facilities. The experience shows that in these countries, a number of existing facilities and their standards tend to be poorer than in countries that accept an active role. Denmark, France and Germany are examples for strong government involvement. These countries have been able to build a comprehensive waste management including public facilities within a reasonable time frame. I think I'd rather skip a part to keep in the time frame and switch to the control issue. The establishment of an effective control mechanism is an essential must in organizing hazardous waste management. Although there are differences in the practical execution of control measures in the different European countries, all of these countries have an acted control legislation. The enforcement of control is regarded as an indispensable duty of government agencies or other

administrative bodies irrespective to which organizational pattern hazardous waste management is followed by the individual state. It has to be emphasized that control has to be established for all stages of hazardous waste management including hazardous waste generation, storage, transportation and treatment or disposal. Licensing of facilities and of certain activities like transportation is regarded as a basic mean to guarantee that hazardous waste is sufficiently controlled. Licensing of facilities is generally not restricted to waste treatment and disposal facilities but also covers waste generating enterprises and waste storage either on site or off site. It has however to be mentioned that the question, where residue stops to become a waste, is still subject to discussion. In Germany right now, the Federal Government plans to extend control on all problamatic residues which leaves a production facility regardless of whether they are waste according to the German Waste Definition of recyclable material. That does, at the time being, not fall under waste disposal laws and regulations. The idea behind this new legislative issue is that waste, according to German laws, is not a statical term. The same substance can be a waste or a recyclable residue basically following economical frame conditions. As problems did occur with such materials in the past, there have been cases of improper dumping of material that was claimed to be shipped for recycling. The Federal Administration tries to close the existing gap of control between disposal and recycling. Most European countries practise one or another form of trip ticket system to exercise control on hazardous waste stream. I do have a couple of overhead transparencies on this issue and if there is interest I can show them later on. It has to be realized that excessive control will create costs. There are figures that show that up to 20% of disposal costs can be the result of control measures. The central task of a control system is to ensure that hazardous waste is directed along a proper disposal route from waste generator to waste transporter and to ultimate disposal. The surveillance of waste transfers is possibly the most important but also most difficult task in an overall waste control system as waste transfers will be an essential must in any disposal system. Some States, like Denmark, have tried to eliminate excessive transfers of hazardous wastes by obligatory use of one centralized facility and a special system of collection centres and transportation.

Denmark's hazardous wastes are generally transported by railway only. Wherever an open market for hazardous wastes exists, and this is the case in most European countries, all stages of this market must be subject to tight control as the tendency to escape high waste disposal costs cannot be neglected. Without any doubt, control of hazardous wastes flows raises administrative difficulties as it has to try to be comprehensive. Experience shows that a good deal of bureaucracy is indispensable to make the whole system work. On the other hand, this effort has to be accepted, at least for a transitional period. to enforce the wanted conciousness on behalf of waste generators, transporters and waste disposal enterprises. The requirement of a trip ticket system has a very strong educational effect. The automatic flow of information on waste movements to the responsible authorities helps to gain knowledge on waste streams and can be regarded as a good basis for the planning of a comprehensive waste disposal system. There are tendencies, even in Europe, and we have heard some remarks in that direction before, to regard hazardous wastes disposal as a normal industrial activity which can be allowed to follow the general rules of a free market society. There is very little to say in favor of such an attitude and there are, in my opinion, very strong reasons to oppose it. It is quite true and every experience gathered so far proves it, that waste disposal practise follows merely economical considerations unless there are legal restrictions. The decision to dispose of a substance as a waste as such, the first step in waste disposal is an economic decision, at least in principle. It is therefore often stressed that waste avoidance of the use of low waste or non waste technologies, if at all available, will simply be a question of economics and that industry will develop or use such technologies as soon as they are available. Unfortunately, at least as far as European experience goes, it is not quite as simple as that. First of all, the development of new technologies needs incentive. These incentives are, in general, the competitive situation of similar comparable industries. These industries, however, do not try to achieve environmental quality or to gain an award for clean technology. They compete in price and quality of their products, sometimes only in keeping their budgets. Hazardous waste problems will only be regarded as a cost factor, thus research and development with regard to environmental objective

will only start when there is either cost pressure through high disposal prices or public pressure which will influence the companies' good will. I mention this as there is a strong movement in Germany that has the allusion to find a solution for all waste problems in a change of production technology. Although it is quite important to notice the interdependence of production processes and the generation of hazardous wastes, it will not make the comprehensive hazardous waste management system dispensable. Moveover, changes of production processes take time and are no answer to the current and medium term problems. As for hazardous waste disposal, it has to be underlined that the decision to dispose of a waste is basically an economic decision, unless the waste arises unavoidably and cannot be recycled. Costs of disposal thus play a very important role. It can be said that high costs for waste disposable have a positive impact on the development of low waste technology and recycling processes. The same is true for high cost for energy and for material. The disposal, to give an example, of waste oil and lubricants was such an urgent issue some 15 years ago that in Germany a special law was enacted to ensure the proper collection and disposal. Waste oil management was subsidized with payments out of a fund levied together with the mineral oil tax. Today, high prices are being paid for waste oil in good quality and there are suggestions that subsidies for waste oil disposals should be terminated. Such tramatic changes illustrate how a situation can be influenced by different economic determinants. They can, however, not be transferred to hazardous waste in general. It takes time for rising disposal prices to influence a waste generator to change its production processes. Separate collection of waste that needs special care or treatment will be the first step to be taken to reduce disposal costs unless there is a chance to mix waste in order to avoid disposal as a hazardous waste. The European or at least the German experience is that proper enforcement of a hazardous waste management scheme will lead to a decrease in quantities generated as a result of increasing on-site treatment of wastes and treatment within the production facilities and treatment like dewatering, neutralization, detoxication etc. On the other hand, and this has to be kept in mind also, the concentrations of pollutants within a hazardous waste will tend to increase. In other words, the waste will become worse and more difficult to be disposed of. These facts

have to be kept in mind when making surveys on hazardous wastes arising as a basis for hazardous waste management planning. It would however, be naive to presume that the cost relationship between disposal costs and costs of benefit of non-waste technology and recycling would be the only factor that decides which alternative is used. It might be true under the presumption that other ways other than disposal are readily available. This is however, an exceptional case and the European experience shows that there is in fact a great deal of psychology in decision making within industries, particularly where the technical means to reduce waste generation are not fully developed. The influence of budgetary systems within industries cannot be overestimated. It is easier for the management of a company to use existing budgetary funds for current waste disposal than to make a new fund available for research and development or for investments for new technology. The knowledge about economic performance of recycling processes is often poor. Cooperation between different industrial enterprises, aiming at joint ventures to overcome hazardous waste problems economically, is generally not very well developed, if at all. To conclude, the decision to use low waste technology or recycling processes is not made simply in evaluating economic facts. To promote developments in this field needs more than a "laisser-faire, laisser-aller" attitude. It needs straight forward principles of environmental policy and then enforcement with the necessary legislation, a key factor, and I underline this again, of the disposal prices. Waste streams will be directed to facilities which offer disposal at low prices. Although transportation distances will be a limiting factor for long range transportation, there will be competition between disposal enterprises as long as there is free choice of enterprise and free choice of disposal methods. Thus the question should be asked whether hazardous waste disposal can be regarded as an activity for which the free market principles can be applied without additional safe guards. Unless there is some subsidizing mechanisms for equalizing costly disposal operations, technical differences as well as different natural conditions will unavoidably result in different price levels which might not fit into an overall waste disposal concept. Large price differences can hamper the establishment of sophisticated disposal practices for hazardous wastes, even where these techniques are environmentally necessary. Particular

problems may arise where investments for disposal facilities have to come from private industries sectors. And in underlining this fact I refer to recent German experiences with regard to exportation of wastes and low price disposal. I have already mentioned this problem but I think it might be useful to repeat it, giving more detailed information, as it seems to be a very general development that should be anticipated as far as possible when establishing an overall concept. Germany has built a comprehensive hazardous waste management system in the last decade, consisting of a sufficient number of different types of facilities. Unfortunately, we have not yet reached the point to link certain waste types to certain treatment or disposal techniques. This is partly the result of our federal constitution which leaves enforcement with the Federal States. As I presume the same would be true for Canada. Apart from this, there is the option of the transporter trade with waste within Europe, again with the background of different standards for disposal in the different countries. This situation makes it possible to dispose of a given hazardous waste in different federal states or in different European countries at quite different technical and price levels. Their price differences of some 100% in the extreme, compare for example landfilling versus incineration or incineration on land versus incineration at sea. The experience is that sophisticated disposal facilities with high prices for disposal do have serious problems to get enough waste for economic operation. There are however, means to overcome difficulties resulting from different price levels. Such means are, for example, the establishment of strict disposal standards for certain types of waste, linking types of wastes and disposal techniques. The establishment and enforcement of obligatory use of facilities linking waste generators to certain disposal facilities by assignment of speech areas to facilities. Another way is the establishment of uniform price levels through cooperation of industries or through price regulations. And finally, the elimination or limitation of hazardous waste tourism which should result in disturbing waste exportation by requiring a license or prohibiting waste exportation. The Federal Republic of Germany tries to overcome the unsatisfactory experiences with low prices and low standard disposal in making the first steps to introduce uniform standards, linking types of wastes and disposal methods and in introducing an

amendment to the waste disposal act limiting, the options for waste exports to other countries. To conclude I would like to summarize the European experience in hazardous waste management in the past decade as follows: Hazardous waste disposal needs a special management scheme on the basis of legislation covering the definition of what is a hazardous waste and empowering to issue a hazardous waste listing. The second part of legislation should cover the tight control of hazardous waste generation, transportation and treatment or disposal. The organizational issues like duties for disposal, specific areas for facilities, financing and long term care etc. should be covered by appropriate legislation. The establishment of facilities cannot be achieved with legislation alone. Even where legislation applies, this might only lead to new enforcement problems unless there are means to provide facilities. Government involvement in financing, maintaining and operating facilities helps to get facilities with acceptable standards quickly but it might be a better way to force industry to make cooperative efforts to build up a disposal system which fits its needs under tight government control. This way, by the way, has not been tried in Europe yet. Control should not only aim at wastes according to a given definition but to all substances that may become wastes and leave a production facility. Disposal standards and prices are of prime importance. Without adequate general standards, the price will be the determining factor for disposal. The results might be a wake effect towards low price disposal options. That means towards disposal at environmentally insufficient standards. Price ranges of some 100% for the disposal of a given waste will encourage long distance transportation which may create additional hazards. Problems of different price levels and different disposal standards can only be overcome by either obligatory use of certain facilities or by subsidies to high technology facilities. Facilities which can be used for large range of different types of hazardous wastes will be extremely expensive. Public facilities in Europe prove this tendency. It might therefore, be worthwhile to try to get industry to cooperate in the built-up of facilities with adapted technology, either on-site or off-site. Well, I think I have kept you long enough. Thank you very much for your attention.

Mr. Kennedy:

Are there questions for Mr. Szelinski on the European experience particularly Germany.

The Floor:

Might I ask one. A few years ago the Reader's Digest had a model for cleaning up the Rhine. There was some taxing of all the countries involved. Is that working?

Mr. Szelinski:

You are referring to the Waste Water Charges Act I guess. Well, it's a little bit early to report on experience with regard to that, as the charges are levied this year for the first time. And there will be a report by the Federal Government which will be issued in the middle of this year. It works in practise, but my opinion is that the charges are much too low to be, well, to work as an incentive in the wanted way. There are discussions right now to lift the levy of the charges but that would be a subject of strong industrial opposition, I'm pretty sure of. Levying taxes for environmentally hazardous activities or for polluting activities has become a current issue in environmental policy discussions in Europe in general. So people have already discussed the kind of waste tax but without any conclusion so far.

Mr. Emberley:

We appreciate so much your coming all this way to talk to us and to bring us your experience. Would you leave us a copy of your address when you go away?

Mr. Szeinski:

Certainly.

Mr. Emberley:

And would you ask the Chairman if the audience wants to see your transparencies that might be of interest. It would only be 10-15 minutes long. I'd like to see them. Would anybody else want to?

Mr. Szelinski:

They are just examples and I did not want to run around. If I might use this micro over there.

Mr. Kennedy:

Sure.

I do have copies of Mr. Szelinski's presentation in addition to Mr. Ken Simpson's. Other copies I don't have. I was able to get those just recently though. They will form part of our final report. As you know if there is any interest in getting copies prior to that, please see me about that

Mr. Szelinski:

Apparently Germany is much too large to fit. Well this gives you some idea of, here we are, of the German disposal systems. At the Federal States Borders are the red lines and all the symbols that you see there are hazardous waste disposal facilities. Different symbols for hazardous wastes landfills, chemical, physical or biological treatment and hazardous wastes incineration facilities. Well basically any of the Federal States has at least one or two facilities and "W" means North Rhine-Westphalia, that route district and you see that's the basic area where you expect industrial settlements. Quite interesting is Bavaria "BY" down here where you do have a centralized management system and the result is that you only have a couple, quite limited number of facilities, but you do have a lot of transload and transfer stations which serve these facilities. So you have a rather colourful picture showing the different management schemes in the different states. North Rhine-Westphalia has an open market management scheme which has latched on to a lot of small facilities with different standards whereas Bavaria has the other extreme - it has only a few, but large and high technology facilities. We talked about licensing of waste disposal facilities. I, oops upside down, I do have a flow chart on the licensing procedure for waste disposal facilities in Germany and I'm told it, well, it takes about 5 years or even longer before you get a facility approved. You have basically three different steps within the licensing procedure. The

first step is the application which has to be done by the applicant, which might be a public body if it owns the facility or private enterprise and then the plan of the applicant will go to the Auditing Authority which has to publish it and the concerned public can object to the plan. There will be a hearing in which the objections may be settled or not. And if not, there will be a decision of the licensing authority on the unsettled objections. And well, if the decision is that the particulars are not sufficient to come to a decision, the whole circle would start again. There will be a request for additional particulars from the applicant and the story runs up the stages again and after a while, after several meetings, after several hearings you end up with the licensing of a facility and after that you might have a legal contest with the court decision and you come to the incontestability of a disposal facility within a time scale of up to 10 years. Nobody really, well at least, on behalf of the authorities, likes this procedure but I think it is unavoidable if you want to get facilities at all situated where you need them.

Mr. Kennedy:

From your experience Mr. Szelinski, 10 years is about average?

Mr. Szelinski:

Will be about average in Germany right now.

Mr. Kennedy:

I appreciate your comment of 9.5 years that we talked about.

Mr. Szelinski:

There are exception

Mr. Kennedy:

An improvement on that.

Mr. Szelinski:

The Bavarians, for example, who started early in developing it, in developing a hazardous waste scheme have been lucky. They did not get so much

public opposition at that time and they made it within five years. A comprehensive system but all the other states will have severe problems in siting. I think this should do with the transparencies. I do have some on reception centres for hazardous waste disposal or comprehensive disposal system but we have heard all this before.

Mr. Kennedy:

Do you have an overhead on the trip ticket system?

Mr. Szelinski:

Yes I do.

Mr. Kennedy:

Could you maybe run through that one quickly. A number of speakers have mentioned it and I think that's a pretty important part of the province's proposal is this manifest system that insures that the waste gets to where it's suppose to go.

Mr. Szelinski:

I wasn't able to provide copies of the different forms used in English so I just have the system in rough. It consists of six copies of a manifest which are handed around in two circles. So you have two differenct control circuits. The whole set has to be signed by the waste generator who has to forward a copy to the responsible authority at the beginning of transportation. And he has to keep a copy himself. The remaining 4 copies accompany the waste transporter who has to sign the copies for proper transportation and he will bring the waste to the waste disposal facilities which take the copies 3, 4 and 5 and sends the copy 4 back to the authorities, so you have 2 copies at the authorities, 1 from the waste generator and 1 from the waste disposal facility and, they will have to be brought together and so that the authority has at least on paper the proof that the waste has arrived in a licensed facility. There is a deficiency to this system which I freely admit and that is, that it is a post factum control. The waste has already been disposed of when the authority gets the second copy. So there is not

very much you can do. But the mere existence of such a system obliges, particularly transporters and disposers, to care because there will be a control afterwards. On the other hand, we do have a high court ruling that the waste generator does have certain responsibilities with respect to proper disposal of his waste and therefore he gets after the disposal of this waste another copy to be able to realize whether the waste has arrived in the facility where it was sent to. That's the second circuit which is closed through the ticket system and the keeping of documents is, well, if people do not keep their documents in order it will be a punishable offence. So that might help people to bring waste on orderly disposal routes. Well I'm glad to hear questions on this system which is a little bit tricky and there's a lot of administrative work in it, not only for the authorities but also for the three groups of people involved in waste business.

Mr. Richardson:

I was going to comment that the same system is used in Oregon. But ahead of that system there is a complimentary system of paper work whereby the generator is asked to fill out a questionnaire on the nature of the material he wants to get rid of and on that he has to put his generator registration number that is sent to the company who will be processing it, who put on what he thinks is the appropriate treatment and send it on to the bureaucrat, if that who it is down there at the bottom corner. That's Azil. The bureaucrat approves the treatment process, sends a copy back to the generator and back to the facility. The facility then knows that its okay to go and get it and move it. Then this other sytem comes into play. Its fool proof almost.

Mr. Szelinski:

We've discussed a slightly modified system which could not be invented right now because we have an open market in general and we do not have comparable management practices in the different states. What I would suggest, if I just could switch around the system, I would suggest that the waste generator should notify the waste before it comes on the road and together with an approval of the facility and of the authority. It is a general fact that wastes just do not arise out of nowhere. The responsible

industry knows very well about its waste arising and it can store waste for the time necessary to evaluate the disposal route. So that would be, in my opinion, a much better system but its just not feasible in Germany right now. This is an example of the waste list which is in a Statutory Order of Germany and I just put it on to answer the question of particulars on the hazardous wastes. We do have a wastes catalogue and you have, well, just a selection of wastes with the catalogue number and this information has to be given in the accompanying documents. There exists a number for just about every group of wastes. There must be about, I don't know, 500, 600 different index numbers which occur on the accompanying documents and well, we use these numbers for electronic data processing to make the system work more quickly. Another remark on this transparency. Our system of describing hazardous waste is a mixed system giving a generally used term, generally used description of that waste and then in the second column, the characteristics describing the contaminants which are in the waste, without considering the amounts. The question of amounts, we tried to come to a solution in giving additionally the origin so that only enterprises will be covered by this statutory order which generate, well, amounts that need special care and special control. It's a very simple and very, in my opinion, very practical approach because everybody will know exactly whether he falls under this regulation or not without very much testing, without laboratory analysis and well, it seems to work quite sufficiently in practise.

Mr. Kennedy:

Thank you very much Mr. Szelinski.

At this time I would like to make a couple of announcements in preparation for tommorrow. First of all I would like to introduce the workshop coordinators and resource people. We will start with the Siting workshop with Mr. Pat Feschuk and Mr. Mike Van Den Bosch, please stand up. Thank you Gentlemen. Your workshop is going to be in meeting room no. 12 which is down the western most aisle of the Convention Centre and it will be identified with a sign on it saying "Siting". The next one is the Transportation workshop. Would Mr. Vic Stechison, the coordinator, Vic thank you and Mr. Don Berdeny of the Highways Department please stand up so you can,

Oh perhaps he's not here. Okay. Your workshop on Transportation will be in meeting room no. 11. The workshop on Long Term Safety and Monitoring will be in this room down here, which is meeting room no. 13 and it is going to be coordinated by Dr. Frank Labella, Frank is he... I think he must have just left and Carl Orcutt is going to be the resource person. There's Carl over there. The workshop on Public Participation is going to be meeting in room no. 7. It's going to be coordinated by Dave Young with Grant McLeod providing resource. There's David at the back and there's Grant over there. The Recycling and Reclaiming workshop is going to be in meeting room no. 14 and its going to be coordinated by Bill Turnock with Dave Wotton providing the resource function. The workshop on Ownership is going to be held right here and its going to be headed by Al Cerilli along with Edwin Yee, you saw Edwin in one of those slide presentations, providing resource. The workshop on Alternative Technology is being coordinated by Dennis Muldrew, at the front and he is going to be supported by Larry Strachan. Oh, I'm sorry, different on my list. And that's going to be in meeting room no. 8. The workshop entitled "Why Hazardous Waste at All" will be held in meeting room no. 9 and that's going to be coordinated by Hymie Gesser with back up provided by Will Grieve. The workshop on Secure Landfilling is being headed up by Doug Keil with backup by Cliff Lee, Cliff is over there and that's going to be held in meeting room no. 10. The workshop which is going to be a large one I think, on Legislation Regulations is another one that is going to be held here in this room and it's going to be headed up by Barry Webster. This is meeting room no. 1.

Bill Kennedy:

The workshop on Radio active Waste is going to be held in meeting room no. 6 and the coodinator for that workshop is going to be Mr. Ken Emberley. I would like now, to formally close this afternoon's procedings. Thank you all for coming. We do have a cash bar and reception that has now been set up at the end of the room. People who are interested in perhaps talking to your coordinators or your resource people or perhaps some of the remaining speakers are welcome to stay and visit with us. Thank you very much.

Manitoba Symposium on
Hazardous and Special Wastes

SYMPOSIUM EVALUATION

1. Did topics presented Wednesday adequately cover your concerns?

2. What did you find was most helpful in this symposium?

3. What did you find was least helpful to you in the symposium?

4. Were there any aspects of the subject which were not included in the symposium that you would like to see included (or expanded on) if there is a further symposium?

5. List your workshop. Do you feel that the discussions or questions adequately covered the topics? Please make comments.

6. What are your feelings about the facility? (The best aspect? The worst aspect?)

ADDITIONAL COMMENTS:

Information Kit Contents:

1. Available summaries of speakers' presentations.
2. Glossary of hazardous waste terms.
3. A workshop manual explaining the purpose and focus of each workshop.
4. Evaluation questionnaire.
5. Pad and pen.

Winnipeg Convention Centre

Wednesday, March 16
International speakers on hazardous waste management.

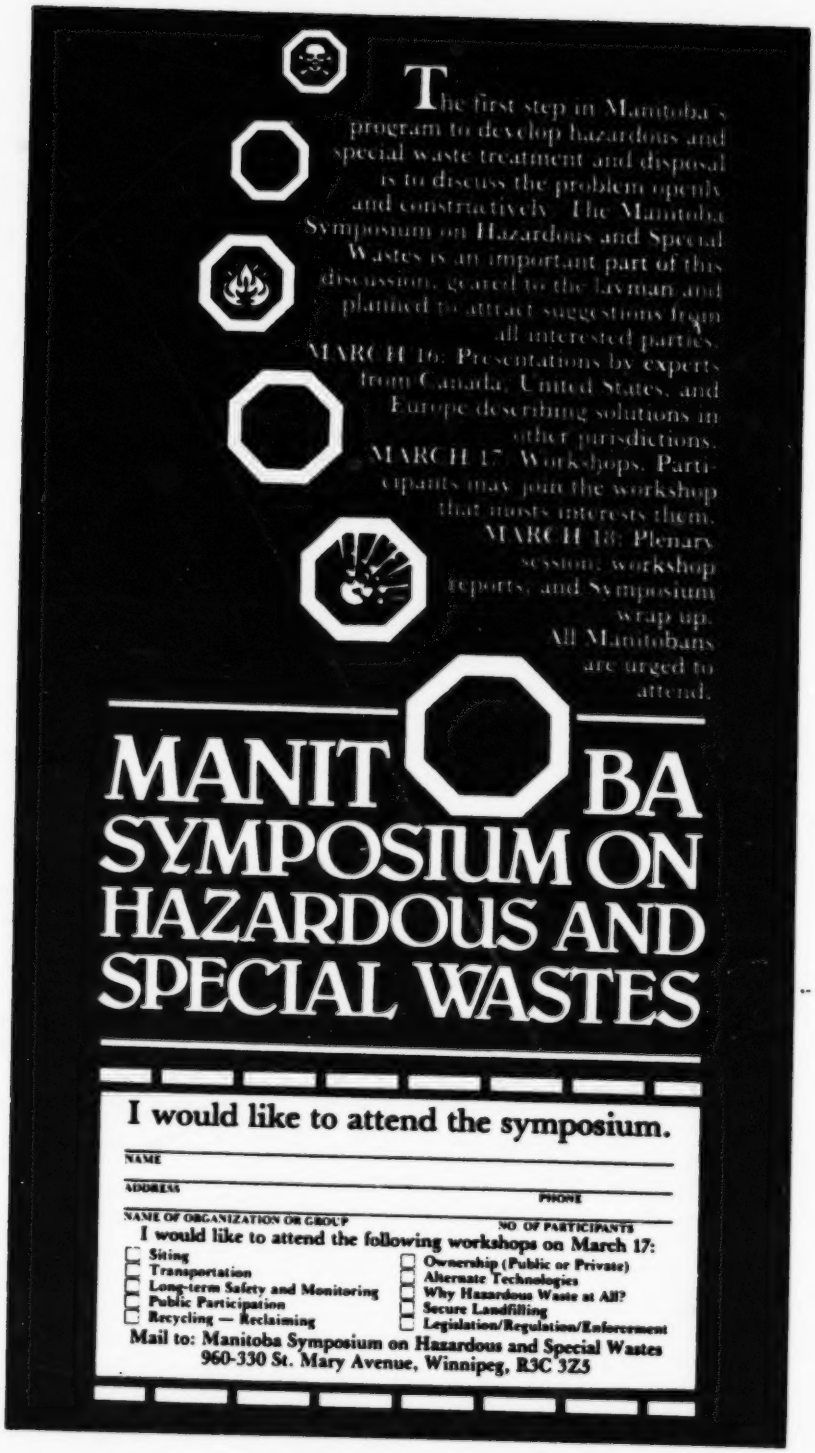
Thursday, March 17
Participants select one of 10 workshops.

Friday, March 18
Plenary session, workshop reports, and recommendations to Manitoba Environment Minister.

All Manitobans are invited to attend at no charge.

Contact:
Manitoba Symposium on Hazardous and Special Wastes
960-330 St. Mary Ave.
Winnipeg, R3C 3Z5
944-5763

MANITOBA SYMPOSIUM ON HAZARDOUS AND SPECIAL WASTES


The first step in Manitoba's program to develop hazardous and special waste treatment and disposal is to discuss the problem openly and constructively. The Manitoba Symposium on Hazardous and Special Wastes is an important part of this discussion, geared to the layman and planned to attract suggestions from all interested parties.
MARCH 16: Presentations by experts from Canada, United States, and Europe describing solutions in other jurisdictions.
MARCH 17: Workshops. Participants may join the workshop that most interests them.
MARCH 18: Plenary session: workshop reports, and Symposium wrap up.
All Manitobans are urged to attend.
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SYMPOSIUM ON
HAZARDOUS AND
SPECIAL WASTES
I would like to attend the symposium.
NAME
ADDRESS
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NAME OF ORGANIZATION OR GROUP
NO. OF PARTICIPANTS
I would like to attend the following workshops on March 17:
Siting
Transportation
Long-term Safety and Monitoring
Public Participation
Recycling — Reclaiming
Ownership (Public or Private)
Alternate Technologies
Why Hazardous Waste at All?
Secure Landfilling
Legislation/Regulation/Enforcement
Mail to: Manitoba Symposium on Hazardous and Special Wastes
960-330 St. Mary Avenue, Winnipeg, R3C 3Z5

Manitoba

Symposium on Hazardous and Special Wastes

March 18, 1983

Speaking Notes

Jay Cowan
Environment Minister

Thank you for the opportunity to share part of this conference with you. I do want to apologize for not being with you over the last few days. However, the constitutional conference in Ottawa prevented my attendance.

My staff have brought me up-to-date on your discussions and the progress you have made throughout this important symposium. I want to congratulate all of you on the commitment and dedication which you have brought to this symposium and which has enabled you to make such significant inroads into resolving this long-standing issue.

I am informed that the Symposium Steering Committee whose members have worked so hard to date to make this symposium the success it was will continue their efforts to prepare a finalized report within a short while and all participants and other interested individuals will be receiving copies.

I say this to you because I believe it is important to re-emphasize the context of this symposium. It is an important stage of an ongoing and continuing process which will lead this province to what we hope to be the best hazardous and special waste management program.

This symposium is so important because the objective we have set for ourselves is of such importance to our society and to generations to come. It is no small task but it is one which must be accomplished.

The subject of hazardous and special materials which has captured your collective attention over the past few days has become an integral part of the world in which we live and work. They have been woven into the fabric of this modern industrial society.

As a society we often leave these hazardous and special wastes as a birthright of every generation yet to be born. We must address that legacy

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we leave for two substantive and compelling reasons.

Firstly, every civilization must maintain and promote a sense of its own future. Today we are the keepers of the entire gene banks of the future. For that reason we have a responsibility to maintain in a healthy state that treasure without which there would be no future which would even vaguely resemble the generations of today.

The second reason we must all share the responsibility for the solution is that we are all part of the problem. We all use hazardous and special material. We all create hazardous wastes as by-products of the activities of each of us. Take a picture - hazardous materials are used. Develop the film and you have hazardous wastes. How are they disposed of? In many instances, a quick trip down the sink. Change your oil. Put weed killer on your lawn. Unplug a drain with cleaner. Paint a room. Each and everytime we do one of the above we create a potential disposal problem. When hundreds of thousands of Manitobans and tens of millions of Canadians clean their drains, develop their films, weed their yards, those potential problems become very real ones indeed.

At the same time, many industries are using those same products. They are often using them in much greater amounts but in many of those same instances their disposal practices differ little from the average homeowner.

So we have wastes of every description from every sector. Household goods from the home, pathological wastes from hospitals, sludges, acids, alkalis, solvents, residues and chemicals from industry. And the list goes on. Many of them are hazardous. Many of them are not disposed of properly. Let there be no doubt - we do have an issue which needs resolution. That is why we must all work together towards a solution. That is why your deliberations of this week and your past and continuing efforts are so needed and important.

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In Manitoba we have the opportunity to avoid the significant disposal problems of other places and other jurisdictions. We can learn from the successful efforts of many who have already addressed significant problems in their own countries in a comprehensive and successful manner. They have shown us what can be done if one uses existing and evolving technology in a comprehensive and courageous way.

You have all heard about both those experiences from a first-hand and expert perspective during this conference so I won't dwell on them at this time. However, I do want to outline in general the process we have developed to address this issue in the context of the Manitoba experience.

We have often spoken about the public involvement necessary to our ongoing efforts. I wish to re-emphasize that commitment again. This symposium is testimony to that commitment and to the reasons behind it. I also believe it to be clear evidence that the process works. Your comments, opinions and suggestions on many complex and diverse issues will provide input into the development of our system here in Manitoba. They are both helpful and sincerely appreciated. We will continue to encourage and promote that public involvement throughout our activities.

The next major step will be to ask the Clean Environment Commission to undertake a series of public hearings on the development of site selection criteria. Those hearings flow both ways. Both the general public and the government will learn together at them. More importantly, we will work through them together.I expect that these hearings will take place over the course of the upcoming year.

In the meantime the government is presently developing comprehensive enabling legislation which will at long last put some order into the management of hazardous and special materials throughout the province.

By the way, your comments and suggestions over the last three days will be reviewed in the context of this development of the actual legislation.

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They will be helpful in ensuring that this legislation accurately reflects the goals and objectives of all Manitobans.

Once the Clean Environment Commission has completed its first series of hearings and that work has been reviewed and analyzed we will be asking them to take that information to the public for further comment and for input on specific sites and management programs for any facilities which are determined to be both necessary and acceptable.

The final stage will be the implementation of a complete and comprehensive hazardous and special waste management program which will serve us all and will serve generations to come.

That program will have to include measures to serve the public throughout the lifetime of hazardous and special wastes. To use the old adage it must be from "cradle to grave". As a matter of fact it will have to go one step further. We must also learn to ressurect those materials through recycling and reprocessing on-site where appropriate. Your comments in that regard are especially well-received and I am looking forward to reviewing them in more detail once the symposium reports are ready.

So that is the challenge which confronts us. We must continue to work together towards that end. We must always listen to each other. We must always respect each other's opinions. We must respect our differences where they exist - as honest reflections of differing perceptions that are sincerely held. We must be creative and realistic in our deliberations and discussions as we design and implement our comprehensive and integrated waste management system.

There is an ancient Roman legal maxim that when translated reads "the people's safety is the highest law". While ancient Rome may not have had the hazardous and special waste management problem we have today, they certainly had the right idea as to how the law should serve the public. We have already begun that work. The last few days have been significant in that regard. I want to thank you for your help, your commitment and the time you have dedicated to this symposium. I offer you my thanks and my

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sincere encouragement to continue your important individual and collective efforts to be a part of the solution we all know is needed.

POOR

QUALITY

ORIGINAL